E911 Accuracy Assurance

Rosum
Santa Clara

May 16, 2007

Rosum TV-GPS provides accurate, reliable location indoors, outdoors and in dense urban locations.

4G Communications, Inc.
Critical Communications Specialists

Table of Contents

Move Ahead.

Table of Figures

Move Ahead.

Table of Tables

Move Ahead.

1 Introduction

1.1 4G Communications, Inc. Overview

4G Communications is a Small Disable Veteran Owned Business **(SDVOB)** dedicated to providing critical communications solutions to those entities requiring time sensitive delivery of critical information. 4G communications also provides Professional Services including project management, systems solutions and system integration into turnkey solutions.

4G Communications has many years of combined experience providing critical communications and project management to both government and commercial providers. 4G Communications background stems from a Military Special Operations background as well as experience working within Department of Defense, Joint Special Operations, Special Forces, as well as other federal government agencies communications.

The 4G Communications team has extensive experience implementing Enhanced 911 service for numerous carriers across the US working with Mobile Position Centers as well as third party vendors.

1.2 Executive Overview

This report, commissioned at the request of Rosum, provides a county-level analysis of E911 Phase II Accuracy Validation testing performed for the test area defined as ‘Santa Clara’. The location finding systems within the Santa Clara area are analyzed with respect to the OET Bulletin No. 71 guidelines for E911 Phase II compliance testing. In addition to the accuracy analysis results, this report documents the testing environment, data collection methods and analysis techniques.

1.3 Scope of Effort

4G performed an E911 Validation Test upon the Rosum location finding system in the ‘test area’ defined as Santa Clara. Validation testing includes a system analysis of the carrier’s network for the purpose of characterizing the expected performance of the E911 Location Determining Techniques (LDT) implemented in the area under test. Specifically, 4G follows an efficient procedure designed to meet and exceed the guidelines outlined in the OET Bulletin No. 71. An overview of the testing methodology is included in the report as Appendix C. 4G Communications followed the guidelines as prescribed by ATIS 0500011in order

to identify the specific parameters for testing the City of Santa Clara as an intermediate environment between suburban and urban which led to the select of sites.

Due to the random nature of test point selection, the indoor test calls will be distributed throughout the various categories of usage environments. The usage environment for the one-time performance report may include an aggregate of the location estimate for all of the test calls that occur within that usage environment. Wireless carriers may, optionally, state indoor versus outdoor test point accuracy estimates as subcategories under each usage environment.

The indoor test calls include each of these four usage environments should, when possible to identify from existing data, reflect the typical nature of indoor usage in each environment.

A. Indoor calls in a rural environment should generally be in settings that create low penetration loss.
B. Indoor calls in a suburban environment should have a mix of indoor calls in settings with low and moderate penetration losses. N The exact ratio is up to the body that performs the tests and would reflect the nature of the network under tset and its typical usage in the given test environment. However, a reasonable guideline is 25% moderate loss and 75% low penetration loss.
C. Indoor calls in a urban environment should have a mix of indoor calls in settings with low, moderate and high penetration losses. The exact ratio is up to the body that performs the tests, however a reasonable guideline is this case would be 15% high penetration loss, 50% moderate loss and 35% low penetration loss.
D. Indoor calls in a dense urban environment should also have a mix of indoor calls in settings with low, moderate and high penetration losses. The exact ratio is again up to the body that performs the tests; however a reasonable guideline in this case would be 25% high penetration loss, 50% moderate loss and 25% low penetration loss.

Move Ahead.

1.4 Summary of Results

This report concludes that: “the Rosum LDT deployed in Santa Clara is compliant with the FCC Phase II objectives”. Furthermore, the analysis shows a 67% error distance of **36 meters** and a 95% error distance of **65 meters**. The joint 67%,

95% error distance confidence pair is **(37 m, 66 m)** with a confidence interval of **90.01 %**. It should be noted that 50% of the sites tested were conducted in an indoor Environment. Compare to the NRIC VIII which recommends that at least 5% of all tests are conducted in indoor environments

1.5 Scope of Effort

4G performed an E911 Validation Test upon the Rosum location finding system in the 'test area' defined as Santa Clara. Validation testing includes a system analysis of the carrier's network for the purpose of characterizing the expected performance of the E911 Location Determining Techniques (LDT) implemented in the area under test. Specifically, 4G follows an efficient procedure designed to meet and exceed the guidelines outlined in the OET Bulletin No. 71. An overview of the testing methodology is included in the report as Appendix C.

1.6 Summary of Results

This report concludes that: "the Rosum LDT deployed in Santa Clara is compliant with the FCC Phase II objectives". Furthermore, the analysis shows a 67% error distance of **36 meters** and a 95% error distance of **65 meters**. The joint 67%, 95% error distance confidence pair is **(37 m, 66 m)** with a confidence interval of **90.01 %**.

2 Santa Clara Test Call Analysis

This section is divided into three components. First, test call results are analyzed for the un-weighted FCC compliance metrics as specified in OET Bulletin No. 71. Second, the network performance is analyzed for test calls including call yield, solution source results and indoor vs. outdoor accuracy. Finally, the test call geographic distribution is analyzed to ensure the empirical sampling of Santa Clara does not create a 'land-use' bias in the accuracy results.

2.1 Accuracy Analysis

This portion of the report presents the un-weighted FCC compliance results achieved during the E911 Validation Test.

The first step in processing test call data is rounding error values to the nearest meter as interpreted through OET Bulletin No. 71 and following Best Engineering Practices (BEP) regarding significant digits. Following this rounding, the individual call samples are organized into an ordered list and the 67% and 95% error distances are calculated. The following table presents the FCC compliance statistics for errors observed between 1) the PDE log results and 2) the matched test calls' GPS 'Ground Truth' locations.

FCC Compliance Error Distances	67% Error Distance (m)	95% Error Distance (m)	Test Call Count
Un-Weighted	36	65	1,531
FCC Mandate (handset solution)	≤ 50	≤ 150	90.00 % Confidence

Table 1: Un-Weighted FCC Compliance Metrics for Santa Clara

Empirical test calls results are required to achieve a 90% confidence interval pair of 67% and 95% error distances that are within the FCC Mandate. The table below presents the confidence interval results for the un-weighted test calls.

Confidence Interval Results	Test Call Count	67% Conf. Int. Error (m)	95% Conf. Int. Error (m)	Confidence Interval
Un-Weighted	1,531	37	66	90.01 %
FCC Mandate	N/A	≤ 50	≤ 150	≥ 90.00 %

Table 2: Un-Weighted Confidence Interval Results for Santa Clara

A chart depicting the Cumulative Distribution Function (CDF) of the PDE accuracy results is shown below.

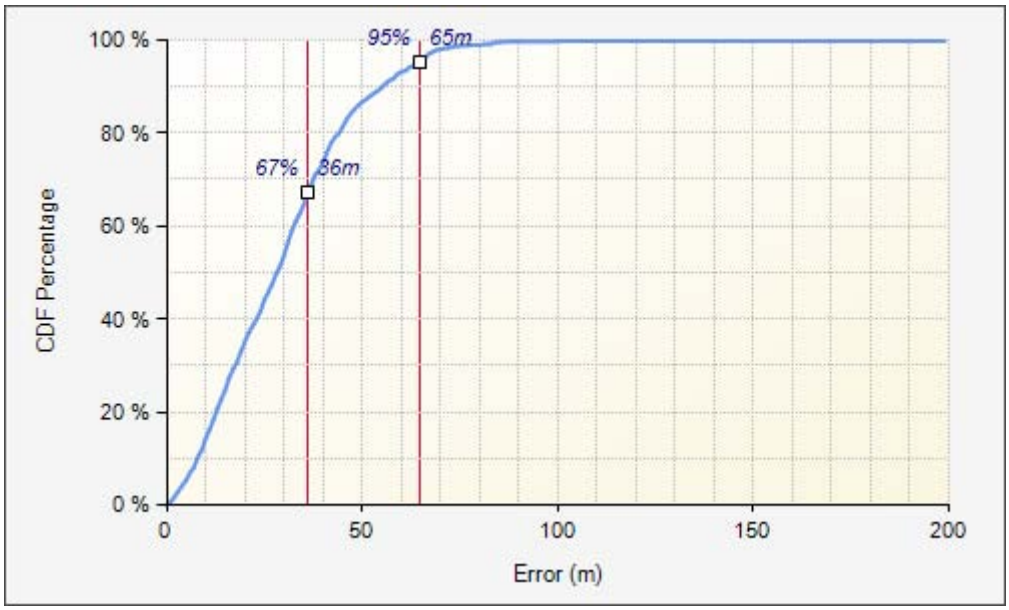


Figure 1: CDF of Un-Weighted PDE Call Statistics for Santa Clara

2.2 Network Performance

This portion of the report provides details on the network performance observed by the test calls.

The next table shows the test call yield, or the percentage of test calls that were successfully matched to the PDE logs, and thus the yield of calls that would return a location result to the PSAP operator.

Test Call Yield	Test Calls Placed	Test Calls Matched	Yield
Un-Weighted	1,531	1,531	100.00 %

Table 3: Test Call Yield for Santa Clara

The table below shows the 67th and 95th percentile error for indoor and outdoor test call types. No distribution is shown with respect to solution source in this table.

Call Type	Count	Percent	67% Error (m)	95% Error (m)
Indoor	754	49.25 %	37	66
Outdoor	777	50.75 %	36	65

Table 4: PDE Accuracy by Call Type for Santa Clara

3 Santa Clara Testing Environment

This section is divided into three components. The first part explicitly defines the 'area under test'. The second provides background material on the testing logistics while the final portion lists functional issues encountered, if any, during testing.

3.1 Definition of the 'Area Under Test'

Santa Clara is defined as containing all of the following Public Service Answering Points (PSAP) shown below.

PSAP Number	PSAP Name
935	San Jose Police Department
954	Santa Clara Police Department
991	Sunnyvale Police Department

Table 5: List of PSAPs within Test Area

3.2 Testing Logistics

Test Points were selected for Santa Clara using a random point generator and filtering to ensure an appropriate mix of land-use types. Field test teams were then deployed to the pre-determined test point locations and location attempts were conducted. For each "test call", the field test team logged a 'ground truth' position using a DGPS unit and simultaneously logged the handset data.

The table below contains information on the testing dates and test call volume.

Testing Logistic	Values
Time of First Test Call	5/7/2007 6:40:13 PM
Time of Final Test Call	5/10/2007 8:36:36 PM
Number of Test Points	30
Average Number of Calls per Test Point	51.03

Table 6: Santa Clara Testing Dates and Test Call Volume

The following figure shows the test area location with land-use types represented by various colors as explained in Appendix C. Test call locations are represented as red circles.

Move Ahead.

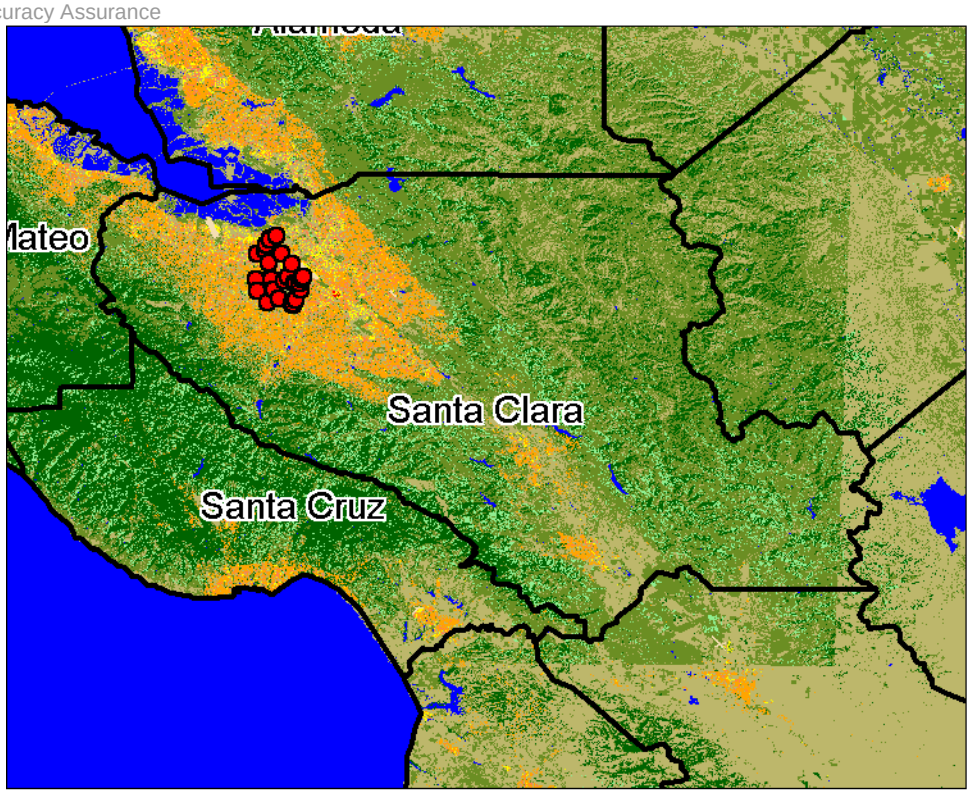


Figure 2: Test Calls Locations for Santa Clara

The figure below shows the distribution of test calls among land use types.

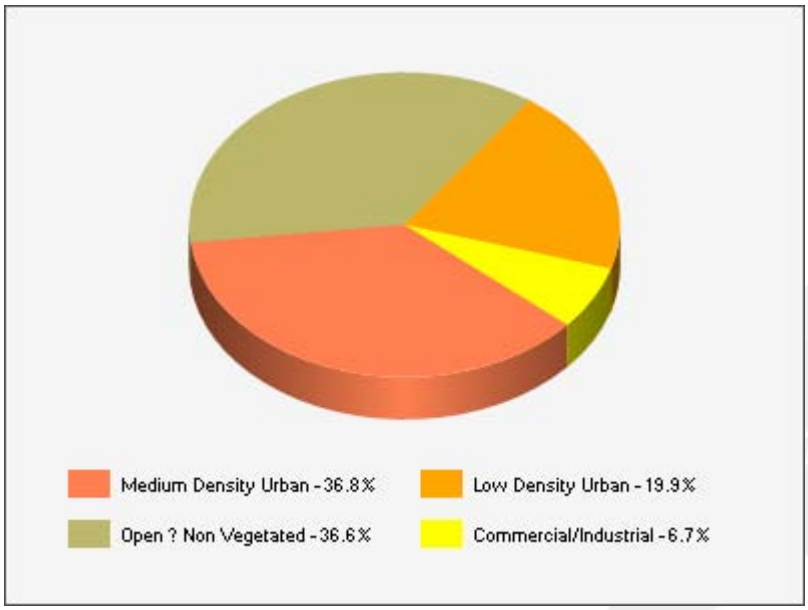


Figure 3: Distribution of Test Calls among Land-Use Types for Santa Clara

3.2.1 Site Selection Objective

The aim of site selection is to make sure that random test points are identified within the Santa Clara, CA PSAP coverage area ensuring that all wireless usage environments within that PSAP are being tested.

3.2.2 Site Selection Process

- A Shape file of the PSAP was used to determine the boundaries of the Santa Clara CA PSAP coverage area.
- The Random Generator was used to identify random points within the PSAP area. 30 Random points were generated and identified as potential test sites.
- Thirteen (13) sites were identified as possible indoor candidates prior to testing and verified once Field technician visited the sites and coordinated with the management of the facilities for testing.
- Two additional indoor test sites were identified in market and coordination was completed with the facility management during site visit.
- Fifteen (15) of the random sites were identified as outdoor candidates making sure that the wireless Usage Environment methodologies were being used.

3.2.3 Survey Methodology

4G Communications Inc surveyed indoor sites via the following process. First, permission was obtained by the local management to test within their facility. Next, 4G personnel identified a DGPS reference point within close proximity of the desired test location. Finally, a distance and bearing measurement from the DGPS reference point was utilized to determine the ground truth of the test location.

- Location: GPS 76 WAAS and differential capable handheld unit (within 3 meters)
- Distance: Laser Range Finder (plus or minus 3 feet)
- Azimuth: Silva magnetic with 14 degrees declination (plus or minus 10 degrees)

The fifteen (15) outdoor test locations were determined by using the GPS 76 with an external antenna. Location was calculated at the location in which the equipment was setup for data collection.

The indoor test point locations were randomly selected to ensure that the testing entity may encounter the following types of indoor settings:

- Low penetration loss: 1 or 2 story house or building made of wood or brick surrounded by similar buildings.
- Moderate penetration loss: First or second floor of 4 to 8 story concrete building with metal frame surround with ample separation by similar or shorter buildings. Locations away from the outer walls and windows are selected.
- High penetration loss: Underground parking lots of shopping center, inside elevators, inner offices of high rise buildings.

Due to the random nature of test point selection, the indoor test calls were distributed throughout the various categories of usage environments. The usage environment for the one-time performance report included an aggregate of the location estimate for all of the test calls that occurred within that usage environment.

3.3 Functional Issues Encountered During Testing

No functional issues were encountered during the test.

Move Ahead.

Appendix A: References

[1] **Cellular Radio-telecommunications Intersystem Operations**
ANSI/TIA/EIA-41-D, Revision D, 1997

[2] **Enhanced Wireless 9-1-1 Phase 2**
TR-45 J-STD-036, Revision AD-2 v5, July 2001

[3] **Guidelines for Testing and Verifying the Accuracy of Wireless E-911 Location Systems**
OET Bulletin 71, April 12, 2000

[4] **Define Topologies & Data Collection Methodologies**
ATIS-0500011, 2006

Move Ahead.

Appendix B: Santa Clara Validation Points

This Appendix contains detailed figures of test locations for each of the sub areas tested in Santa Clara.

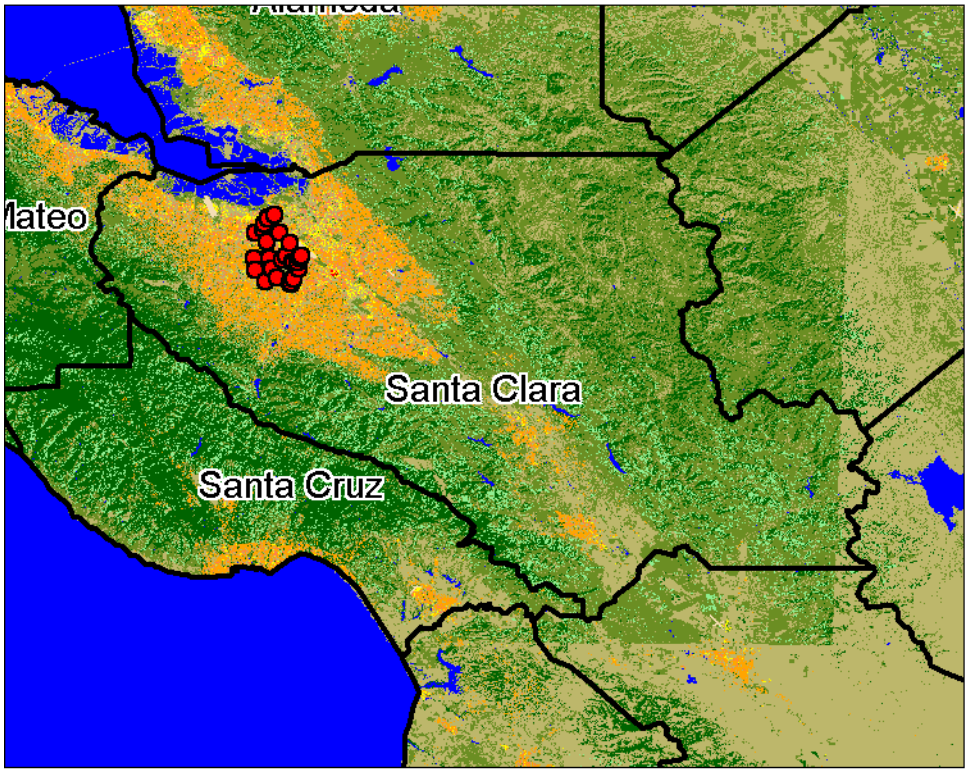


Figure 4: Test locations for Santa Clara County, CA

Move Ahead.

Appendix C: Land-Use Type Definitions

Transportation
Includes areas of major transportation, primarily interstate highways.

Dense Forest
Includes areas of forest with at least 70% crown closure. Found in urban as well as rural areas.

Light Forest - Shrub/Scrub Vegetation
Includes areas of forest with 25%-70% crown closure and may lie in close proximity to open-vegetated regions. Found in urban as well as rural areas.

Open - Vegetated
Includes agricultural land, rangeland, grassland, golf courses, major parks where significant forested areas are not present, but some level of vegetation exists.

Open – Non Vegetated
Includes agricultural land, rangeland, grassland, strip mines, disturbed land, and some paved areas.

Low Density Urban
Mainly residential with homes on large lots. Includes areas where 10-20% of the region is covered by buildings.

Medium Density Urban
Mainly residential with homes on medium or small lots. Includes areas where 20-35% of the region is covered by buildings.

High Density Urban – City Center
Residential and commercial areas, including row houses, apartments, and/or homes on small lots. Includes areas where 35%-60% of the region is covered by buildings. Also includes the central business districts within major metropolitan areas, primarily consisting of tall buildings.

Commercial/Industrial
Consists of areas of medium to heavy industry, medium to large-sized shopping malls, or major business parks.

Airports
Includes airports, minor runway facilities, and runways.

Move Ahead.

Water
Consists of lakes, large rivers and streams, and canals.

Move Ahead.

Appendix D: Site Survey Spreadsheet

Site number	SITE ID	In/Out Test	Penetration Loss	Building Structure	SITE ADDRESS	DGPS LAT	DGPS LONG	Distance (meters)	Bearing (degrees)	Ground Truth Lat	Ground Truth Long	NMEA File name	Test Date	Test Start Time	Test End Time	DGPS Notes	Calculated Notes
site 1	Diesel Store	Indoor	Moderate	4 story concrete building	378 Santana Row suite 1000	37.3206300	-121.9480400	38	85	37.3202933	-121.9480960	4G2_20070508_150839	5/8/2007		1531	water fountain in front of store	test from bench in shoe dept.
site 2	Santana Row Parking Garage	Indoor	High	3 story concrete building	corner of Alyssum lane & Winchester Blvd.	37.3225500	-121.9500600	12	180	37.3224854	-121.9501405	4G2_20070508_153739	5/8/2007			fire hydrant on corner of Alyssum and Winchester	test from 2nd floor NW corner
site 3	Valley Fair Mall	Indoor	Moderate	3 story concrete building	2855 Steven's Creek Blvd	37.3266200	-121.9443200	21	318	37.3264753	-121.9444333	4G2_20070508_162333	5/8/2007			outside food court, second table from left on back wall	test from table in from of sushi bar
site 4	Starbucks	Indoor	Low	1 story brick building	990 Linden st suite 71	37.3395700	-121.9388300	8	55	37.3395716	-121.9388974	4G1_20070510_092735	5/10/2007	930	1000	24 min parking sign in front	test from first table on the right from front door
site 5	Bension Memorial Center	Indoor	Moderate	2 story brick and concrete building.	Santa Clara University	37.3481400	-121.9391400	21	245	37.3483288	-121.9391478	4G2_20070510_101827	5/10/2007	1015	1034	trash can 2nd from bldg, right side facing bldg	Test from 2nd table on the right inside the front door.
site 6	Santa Clara Public Library	Indoor	Moderate	First level of brick building.	1098 Lexington Street	37.3474900	-121.9447300	9	234	37.3474939	-121.9446540	4G2_20070510_104925	5/10/2007	1050	1102	rock memorial in front of library	test from corner table by window facing rock memorial
site 7	Blimpie Sub Shop	Indoor	Low	1 story concrete building	1345 Coleman Road	37.3565800	-121.9357900	8	220	37.3566517	-121.9357840	4G2_20070510_111438	5/10/2007	1114	1129	flower pot in front	test from first table on the left inside front door
site 8	City Hall Coffee Shop	Indoor	High	4 level brick and concrete building	1500 Warburton Ave.	37.3553600	-121.9545700	24	170	37.3555626	-121.9544995	4G2_20070510_114243	5/10/2007	1142	1157	tree memorial next to plaque	test from table directly in front of the front entrance

© 2007 4G Communications, Inc

Site number	SITE ID	In/Out Test	Penetration Loss	Building Structure	SITE ADDRESS	DGPS LAT	DGPS LONG	Distance (meters)	Bearing (degrees)	Ground Truth Lat	Ground Truth Long	NMEA File name	Test Date	Test Start Time	Test End Time	DGPS Notes	Calculated Notes
site 9	Pizza Hut	Indoor	Low	1 story brick building	2695 El Camino Real	37.3526100	-121.9752000	24	336	37.3523964	-121.9751696	4G2_20070510_121107	5/10/2007	1211	1226	pizza hut sign on road	test from table next to window in line of sight of pizza hut sign outside
site 10	Mexicali Grill	Indoor	Low	1 story brick building	3149 Mission College Blvd.	37.3893000	-121.9838900	18	10	37.3891641	-121.9839739	4G2_20070510_131815	5/10/2007	1318	1336	flower pot in front	test from 1st table on right from front entrance
site 11	Hilton	Indoor	Moderate	multi story concrete building	4949 Great American Park Way	37.4028900	-121.9772100	40	116	37.4025402	-121.9771285	4G1_20070508_90753	5/8/2007		924	American flag in front	test from lobby table on the left from the front door
site 12	Hyatt Regency Hotel	Indoor	Moderate	multi story concrete building	5101 Great American Park Way	37.4050200	-121.9770300	45	55	37.4050290	-121.9774176	4G1_20070508_102038	5/8/2007		1038	by water fountains, left "no ped access" sign	test from glass table behind hotel directory map in lobby
site 13	Carl's Jr.	Indoor	Low	1 story brick building	2900 Bowers Road	37.3743900	-121.9780500	24	294	37.3744458	-121.9782478	4G2_20070508_123227	5/8/2007		1250	Carl's Jr. sign at intersection	test from 1st 4 person table on the right from the single red door
site 14	McDonalds	Indoor	Low	1 story brick building	3509 Homestead Road	37.3380100	-121.9936100	36	314	37.3383299	-121.9936581	4G2_20070508_130600	5/8/2007			Mc Donald's sign on road (has "drive thru" on it)	Test from 3 booth on the left from the entrance.
site 15	Taco bell	Indoor	Low	1 story brick building	2600 Homestead Road	37.3394900	-121.9726100	6	206	37.3395021	-121.9726593	4G2_20070508_133158	5/8/2007			light pole next to drive thru lane	test from corner booth left from door facing main road
site 16	Dionex Parking Lot	Outdoor	Moderate	N/A	541 Lakeside Drive	37.3854800	-121.9937000	N/A	N/A	37.3854800	-121.9937000	4G2_20070507_113846	5/7/2007		1153	Parking spot closest to road in front of building	N/A

Move Ahead.

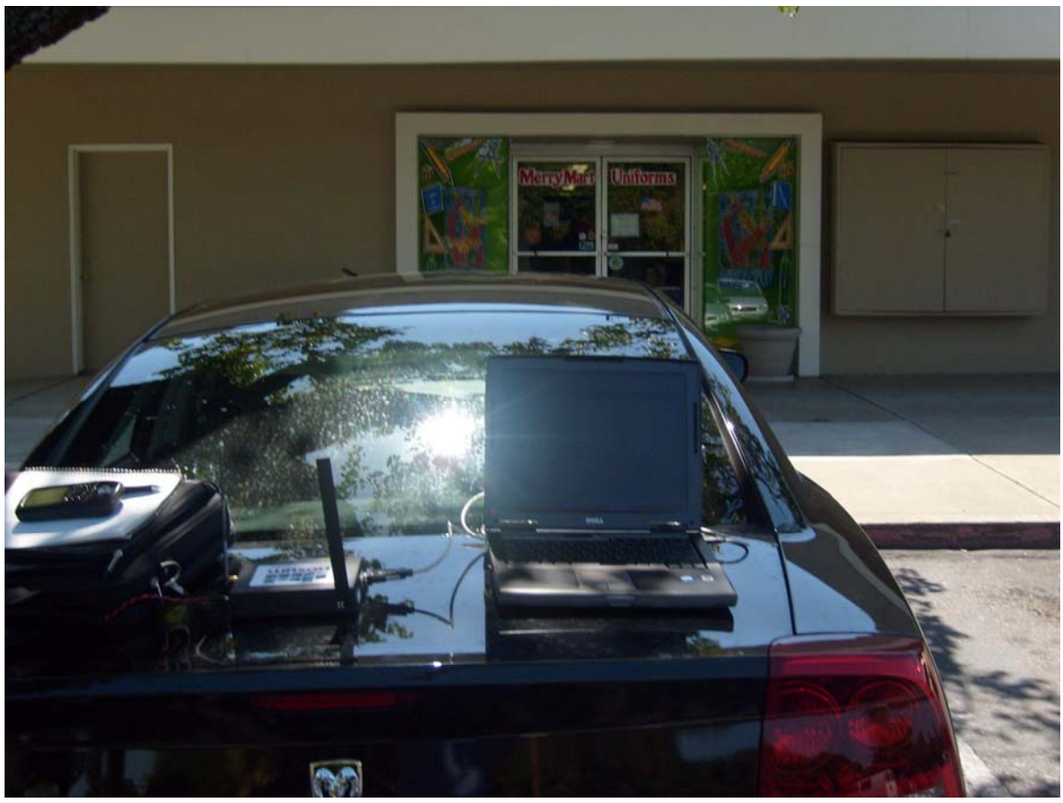
Site number	SITE ID	In/Out Test	Penetration Loss	Building Structure	SITE ADDRESS	DGPS LAT	DGPS LONG	Distance (meters)	Bearing (degrees)	Ground Truth Lat	Ground Truth Long	NMEA File name	Test Date	Test Start Time	Test End Time	DGPS Notes	Calculated Notes
site 17	Med Immune Parking Lot	Outdoor	Low	N/A	3055 Patrick Henry Drive	37.3961100	-121.9824900	N/A	N/A	37.3961100	-121.9824900	4G2_20070507_120657	5/7/2007		1217	Parking spot beside sign, East end of building	N/A
site 18	City of Santa Clara Fire Station #10	Outdoor	Low	N/A	5111 Stars and Strips Drive	37.4068200	-121.9687300	N/A	N/A	37.4068200	-121.9687300	4G2_20070507_124248	5/7/2007		1257	Parallel parking spot in front of fire station, closest to garage doors	N/A
site 19	Furniture Discounts Parking Lot	Outdoor	Moderate	N/A	3660 C Mission College Blvd.	37.3851200	-121.9617700	N/A	N/A	37.3851200	-121.9617700	4G2_20070507_133026	5/7/2007		1347	Parking spot beside free standing Furniture Discounts sign	N/A
site 20	Hitachi Data Systems Parking Lot	Outdoor	Moderate	N/A	800 Lafayette Street	37.3721200	-121.9499700	N/A	N/A	37.3721200	-121.9499700	4G2_20070507_140322	5/7/2007		1417	Parking spot beside water pipes, in front of Hitachi sign	N/A
site 21	Santa Clara Cal Train Station	Outdoor	Low	N/A	1137 Railroad Avenue	37.3529800	-121.9367800	N/A	N/A	37.3529800	-121.9367800	4G2_20070507_143837	5/7/2007		1452	Parking spot 129 compact, in front of bus stop in front of train station	N/A
site 22	Merry Mart Uniforms Parking Lot	Outdoor	High	N/A	33 Washington Street	37.3389200	-121.9377200	N/A	N/A	37.3389200	-121.9377200	4G2_20070507_150308	5/7/2007		1517	Backside of building, parking spot in front of building far left beside tree	N/A
site 23	Wilsons Jewl Bakery Parking Lot	Outdoor	Low	N/A	1285 Holmstead Road	37.3478800	-121.9471300	N/A	N/A	37.3478800	-121.9471300	4G2_20070507_152718	5/7/2007		1542	First 24 minute parking spot beside road, Homestead street	N/A

Move Ahead.

Site number	SITE ID	In/Out Test	Penetration Loss	Building Structure	SITE ADDRESS	DGPS LAT	DGPS LONG	Distance (meters)	Bearing (degrees)	Ground Truth Lat	Ground Truth Long	NMEA File name	Test Date	Test Start Time	Test End Time	DGPS Notes	Calculated Notes
site 24	TOD'S Apparel Parking Lot	Outdoor	High	N/A	1090 Santa Row	37.3214200	-121.9478400	N/A	N/A	37.3214200	-121.9478400	4G2_20070507_161125	5/7/2007		1627	First parallel parking spot after Tatum lane & Santana row, in front of TOD"S	N/A
site 25	Longs Drugs Parking Lot	Outdoor	Low	N/A	222 Saratoga Avenue	37.3286000	-121.9663100	N/A	N/A	37.3286000	-121.9663100	4G2_20070507_165214	5/7/2007		1707	First non-handicap parking spot left of front entrance	N/A
site 26	Round Table Pizza Parking Lot	Outdoor	Moderate	N/A	4400 Stevens Creek	37.3229000	-121.9798400	N/A	N/A	37.3229000	-121.9798400	4G2_20070507_172042	5/7/2007		1733	Far right parking spot facing 4400C & B, East side of building	N/A
site 27	Carl's Jr. Parking Lot	Outdoor	Low	N/A	2900 Bowers Road	37.3744400	-121.9780200	N/A	N/A	37.3744400	-121.9780200	4G2_20070508_83301	5/8/2007		847	Parking spot facing Bowers street, Right corner, second spot beside sign	N/A
site 28	Chilli's Parking Lot	Outdoor	Low	N/A	3591 El Camino Real	37.3526700	-121.9951600	N/A	N/A	37.3526700	-121.9951600	4G2_20070508_92359	5/8/2007		945	Parking spot in front of building far left	N/A
site 29	Mervyns Plaza Parking Lot	Outdoor	Moderate	N/A	2205 Anna Drive	37.3510400	-121.9596100	N/A	N/A	37.3510400	-121.9596100	4G2_20070508_95341	5/8/2007		1007	First parking spot beside Tall Plaza sign on Scott Blvd.	N/A
site 30	Texaco Parking Lot	Outdoor	Low	N/A	3500 Holmstead Road	37.3377200	-121.9934900	N/A	N/A	37.3377200	-121.9934900	4G2_20070508_104900	5/8/2007		1102	First parking spot beside teaco, beside big tree facing Homestead rd.	N/A

Move Ahead.

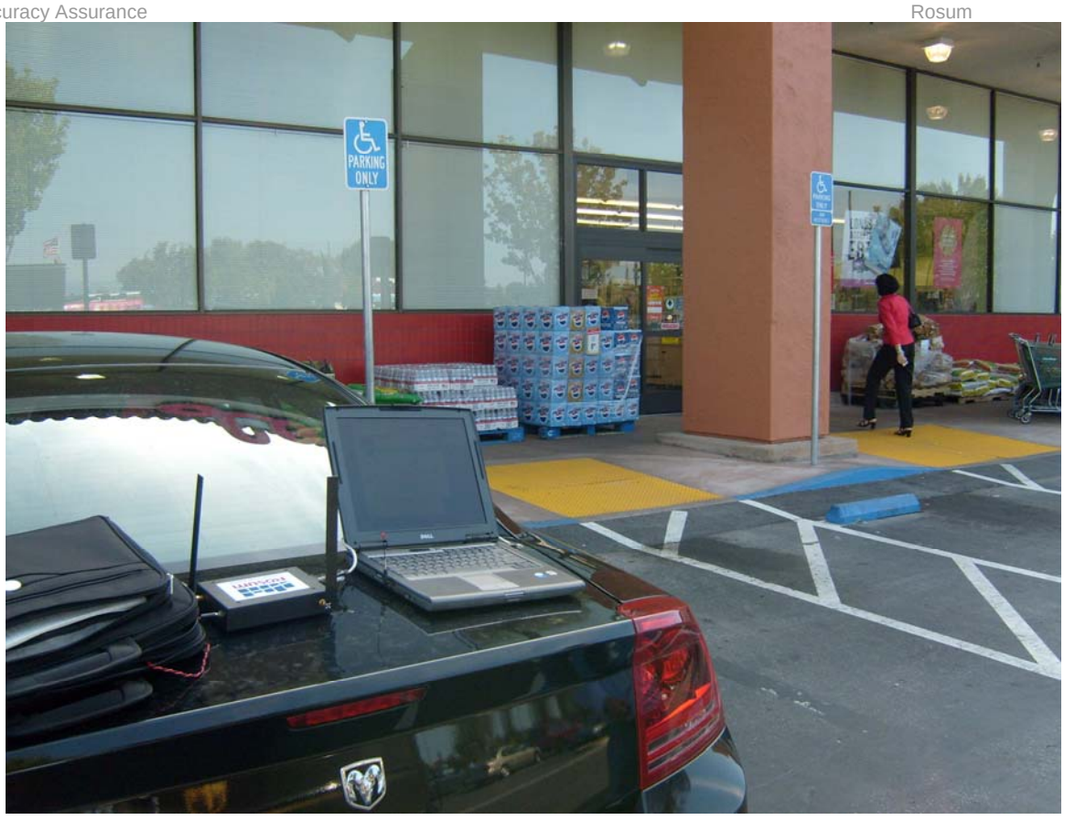
Appendix E: Photographs



33 Washington st_05072007.JPG

Site 22

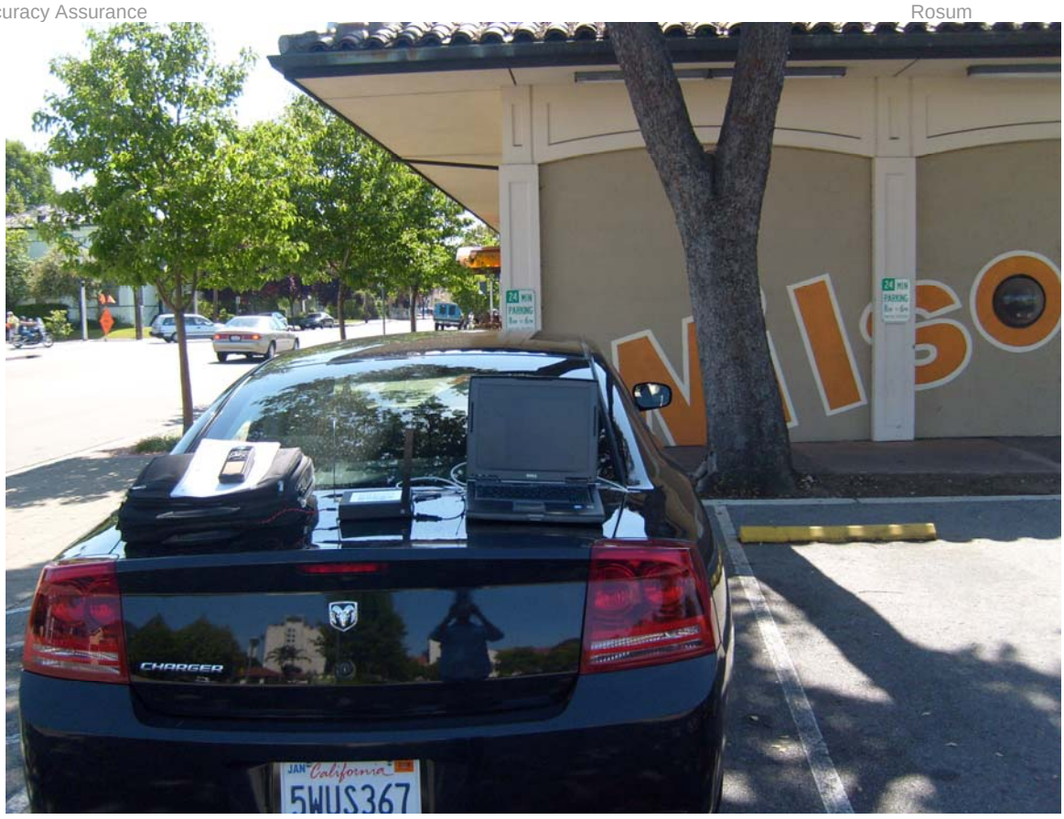
Move Ahead.



222 Saratoga ave_05072007.JPG

Site 25

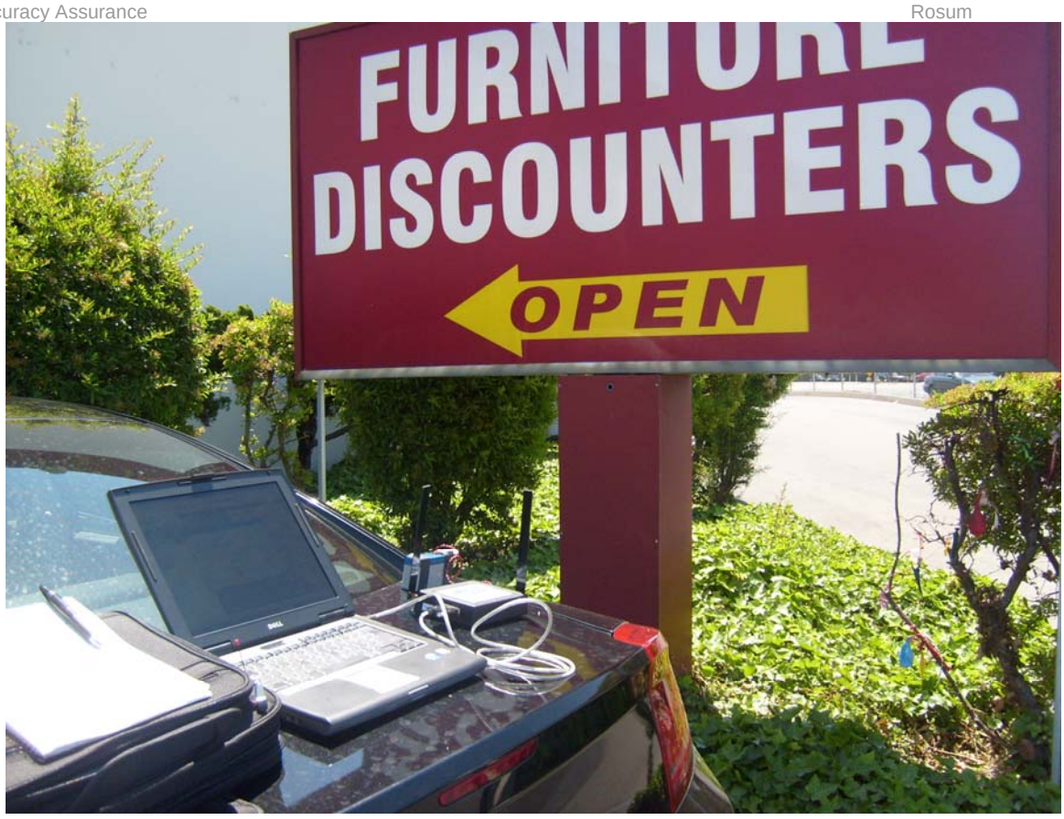
Move Ahead.



1285_Homestead rd_05-07-07.JPG

Site 23

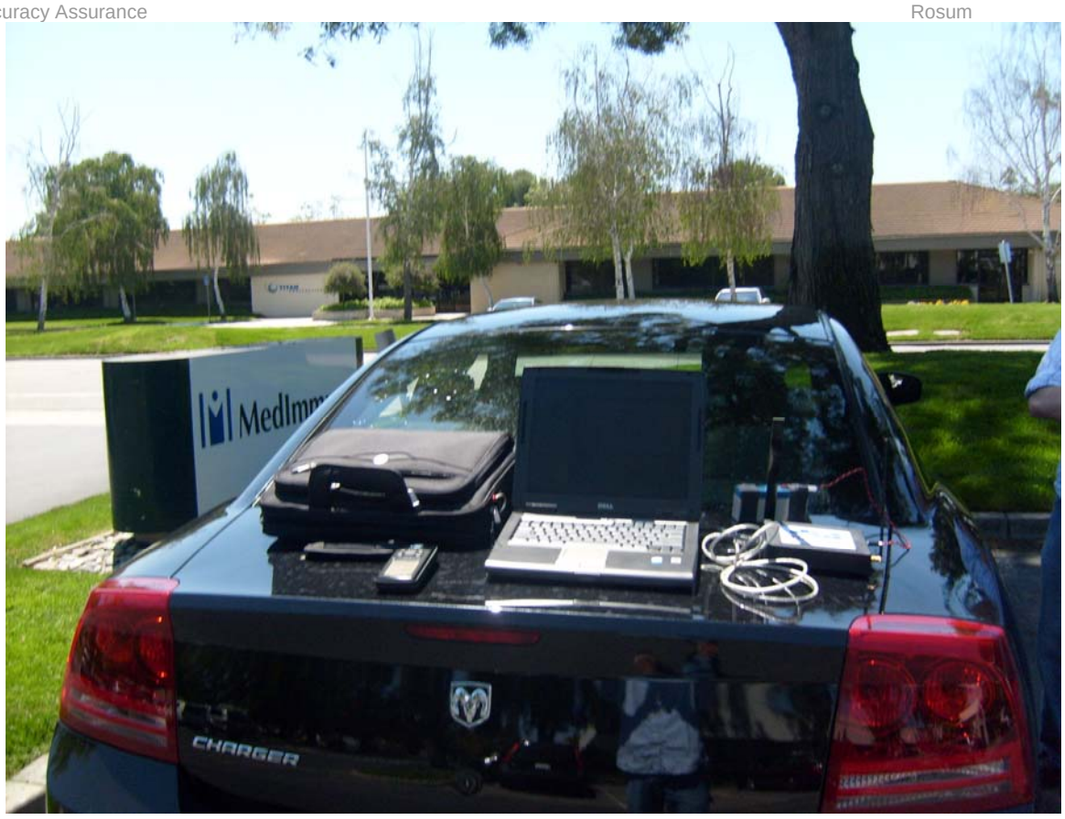
Move Ahead.



3660C Mission College Blvd_05072007.JPG

Site 19

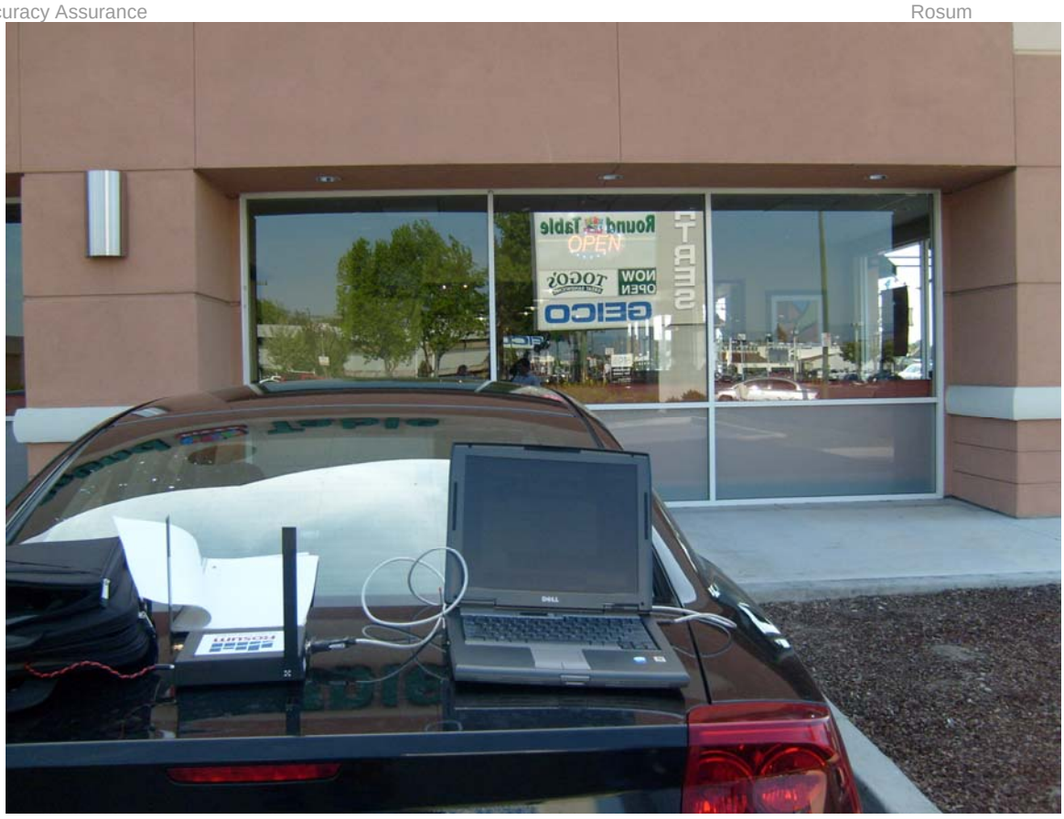
Move Ahead.



3055 Patrick Henry Dr_05072007.JPG

Site 17

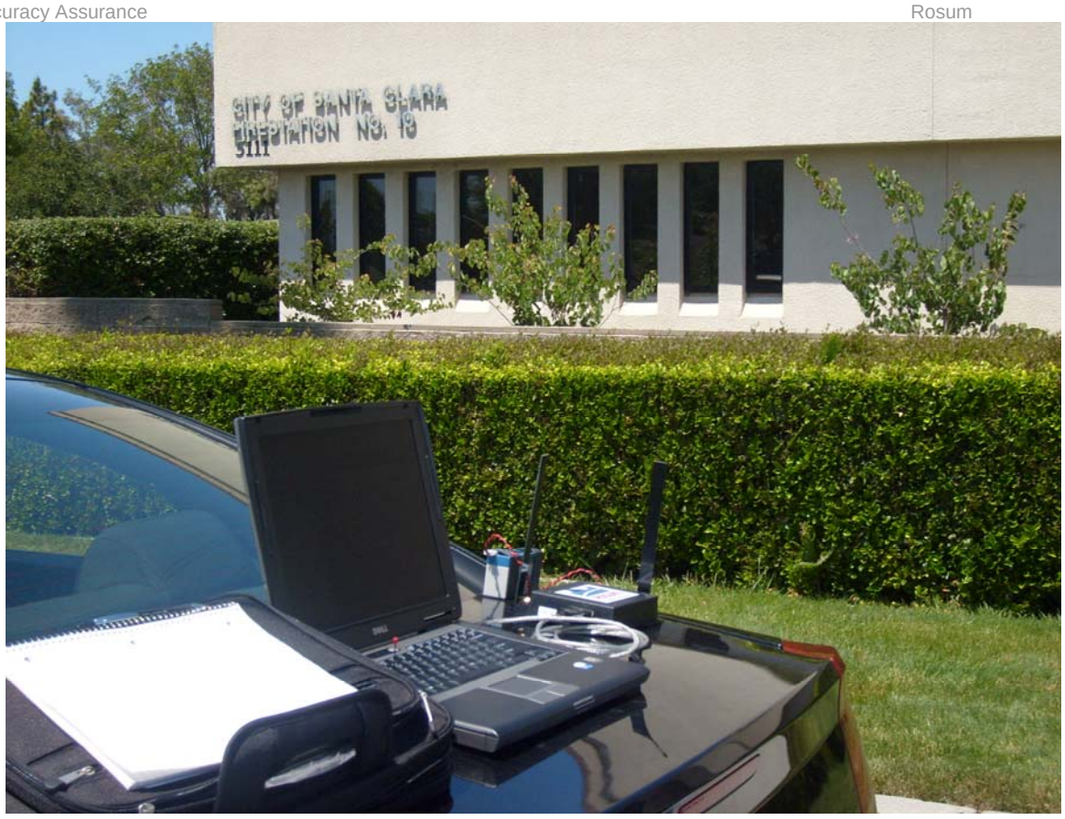
Move Ahead.



4400 Stevens Creek_05072007.JPG

Site 26

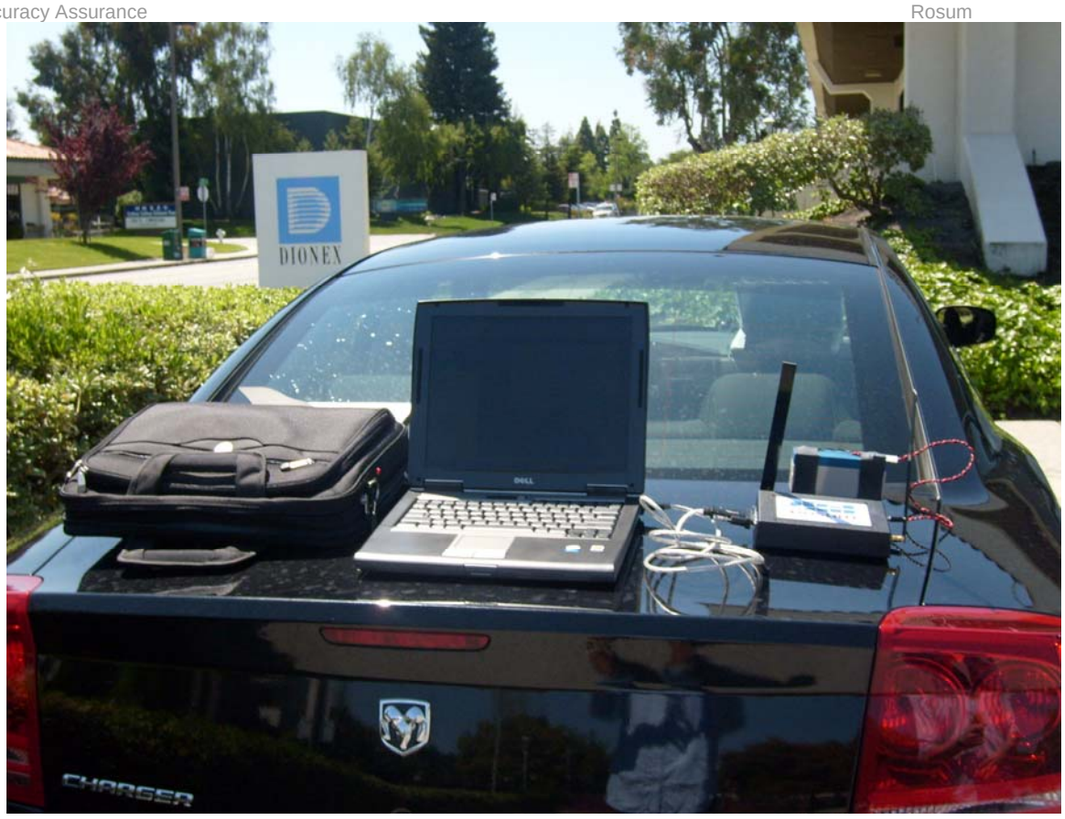
Move Ahead.



5111 Stars and stripes dr_05072007.JPG

Site 18

Move Ahead.



541_Lakeside_05072007.JPG

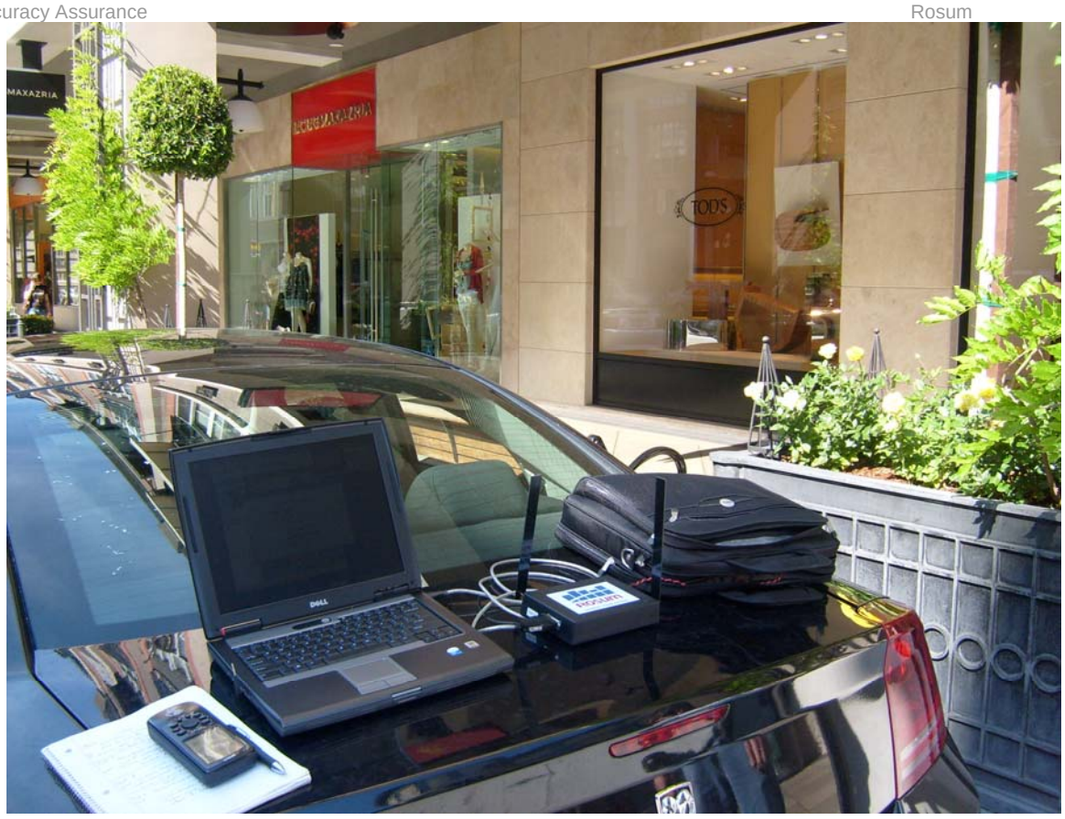
Site 16

Move Ahead.

800 Laffayette st_05072007.JPG

Site 20

Move Ahead.



1090 Santana Row_05072007.JPG

Site 24

Move Ahead.

1137 Railroad Ave_05072007.JPG

Site 21

Move Ahead.

2205_Anna dr_05082007.jpg

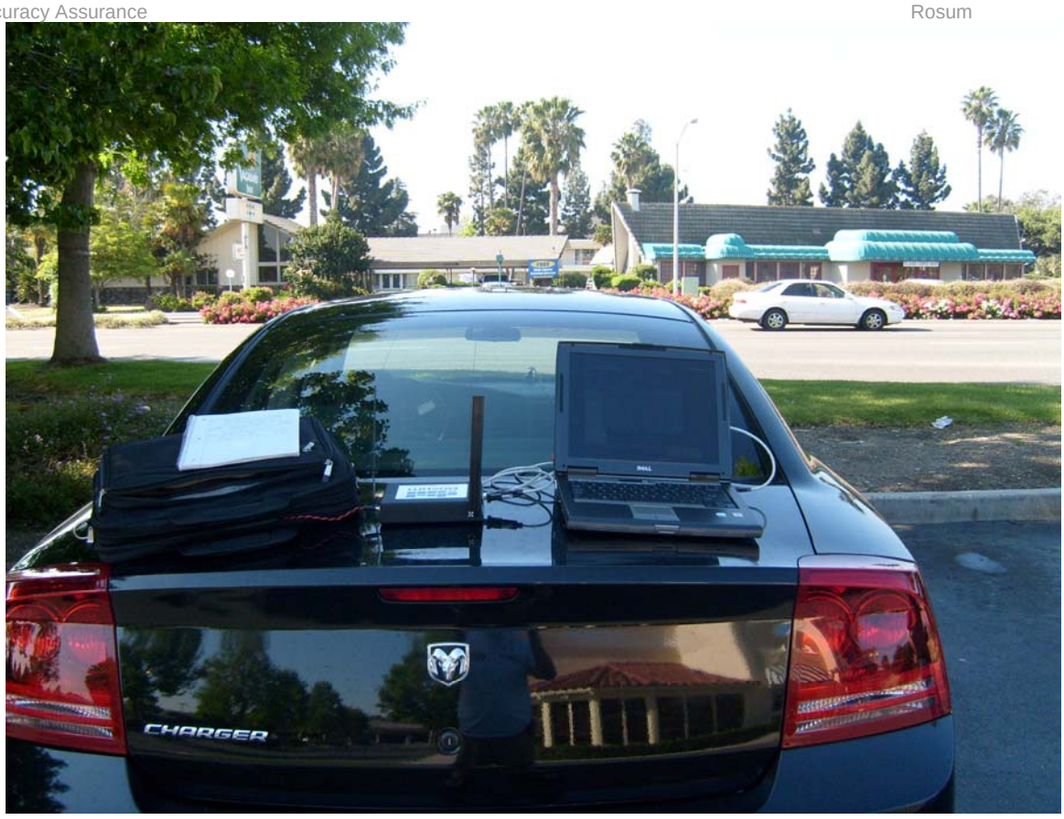
Site 29

Move Ahead.

2900 Bowers Rd_05082007.jpg

Site 27

Move Ahead.



3591_el Camino Real_05082007.jpg

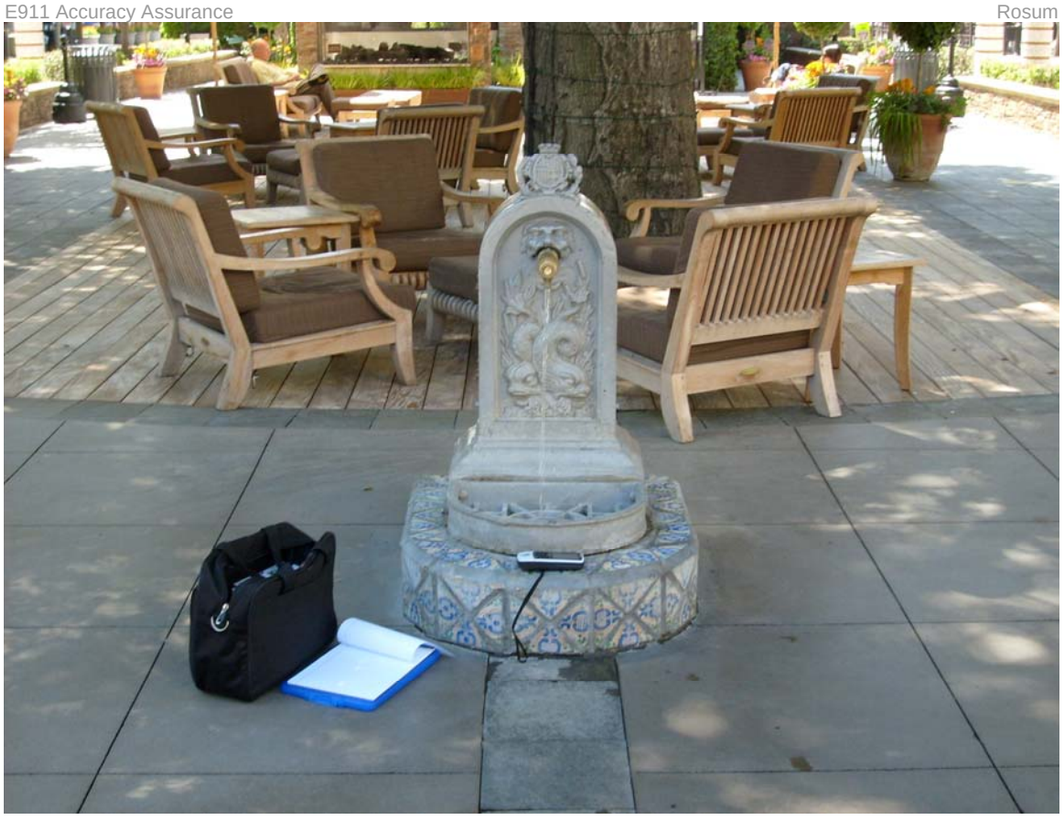
Site 28

Move Ahead.

3500 Homestead Rd_05082007.jpg

Site 30

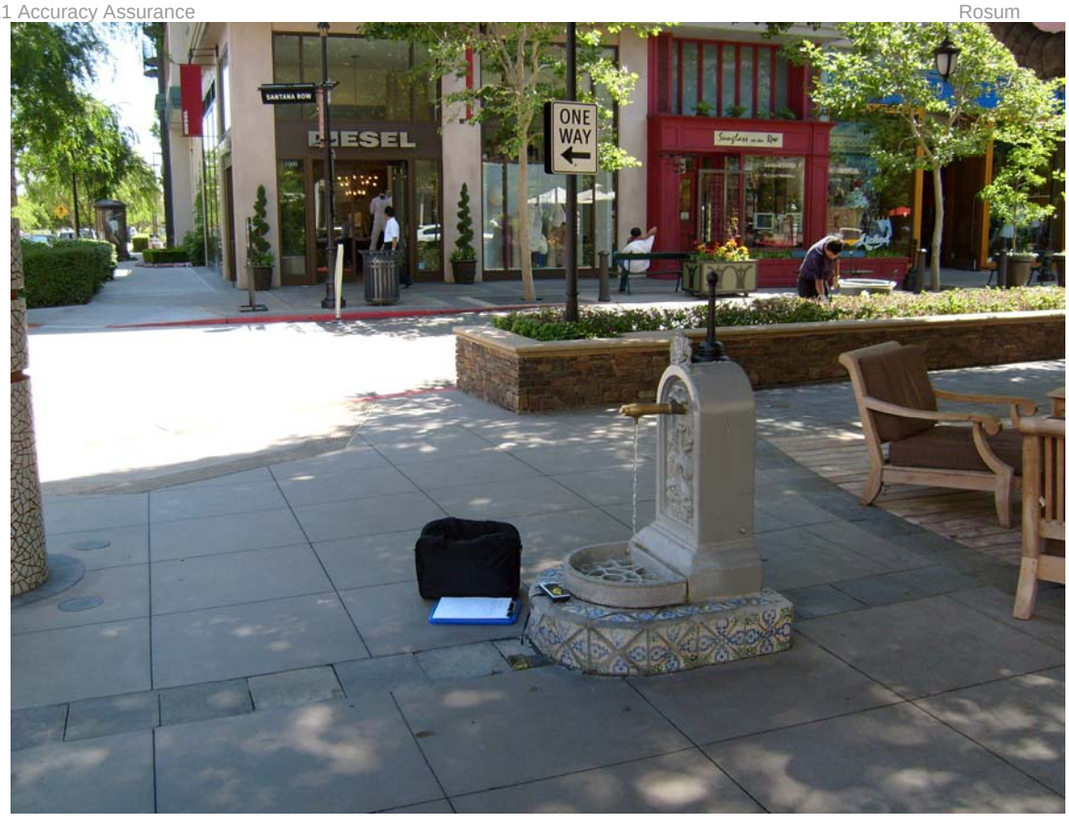
Move Ahead.



378_Santa Row Suite 1000_Reference Point.jpg

Site 1

Move Ahead.



378_Santa Row Suite 1000_Facility.jpg

Site 1

Move Ahead.

378_Santa Row Suite 1000_test point.jpg

Site 1

Move Ahead.

4949_Great American Parkway_Reference Point.jpg

Site 11

Move Ahead.

4949_Great American Parkway_Facility.jpg

Site 11

Move Ahead.

4949_Great American Parkway_Test Point.jpg

Site 11

Move Ahead.

5101 Great American Parkway_Reference Point.jpg

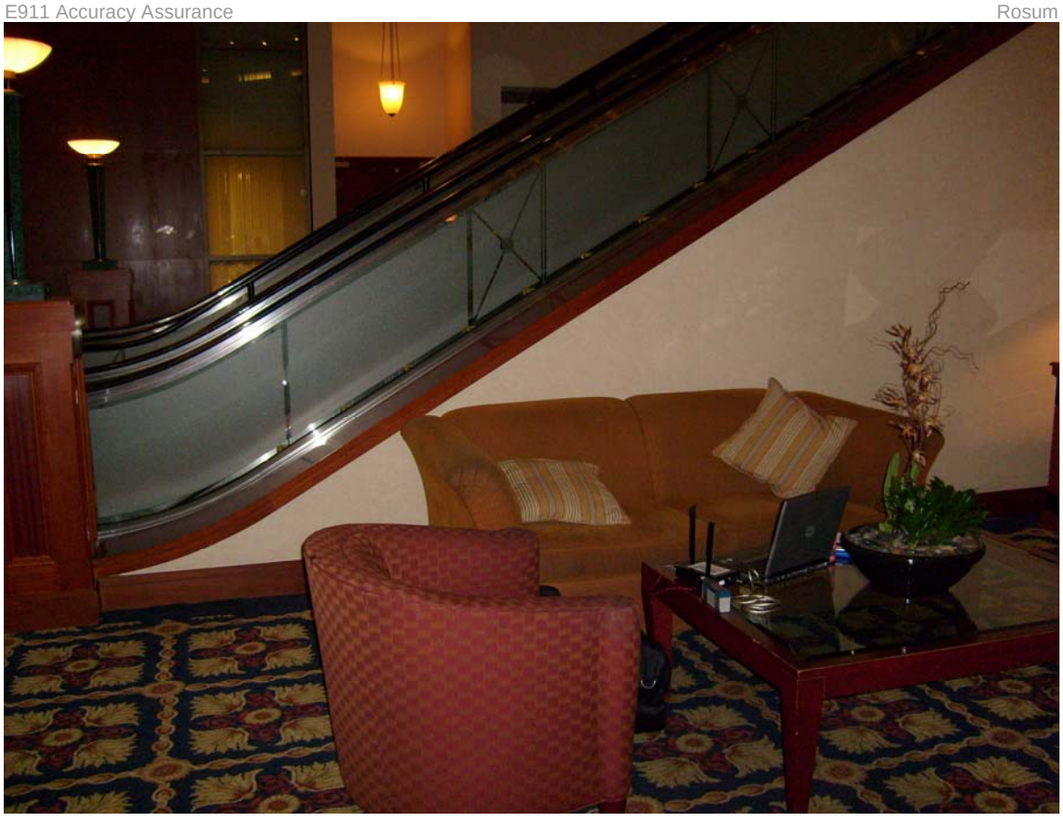
Site 12

Move Ahead.

5101 Great American Parkway_Facility.jpg

Site 12

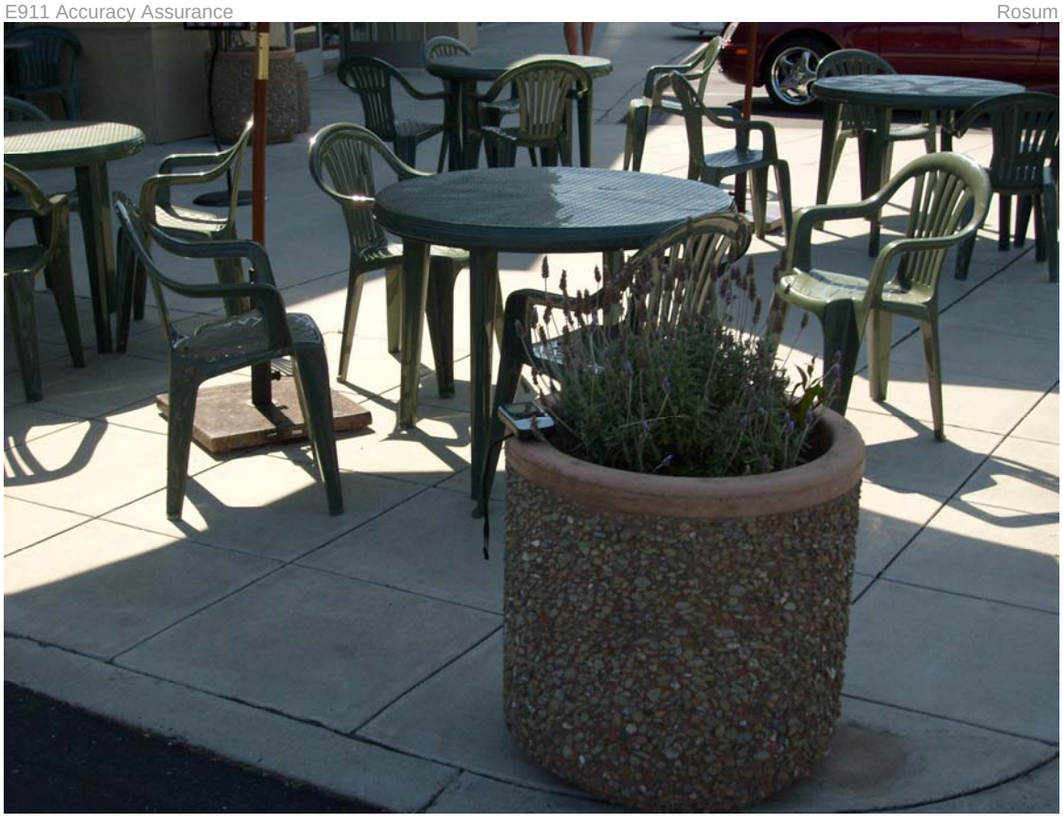
Move Ahead.



5101 Great American Parkway_ Test Point.jpg

Site 12

Move Ahead.



1345_Coleman Rd_Reference Point.jpg

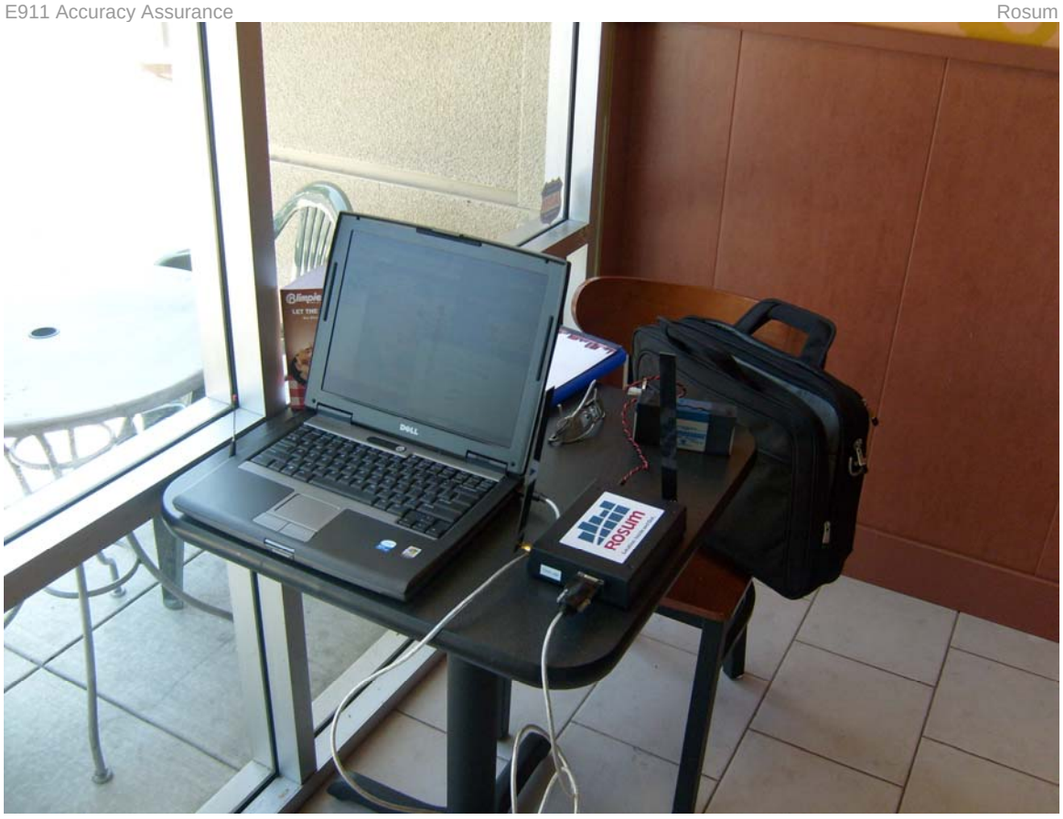
Site 7

Move Ahead.

1345_Coleman Rd_Facility.jpg

Site 7

Move Ahead.



1345 Coleman Rd_Test Point.jpg

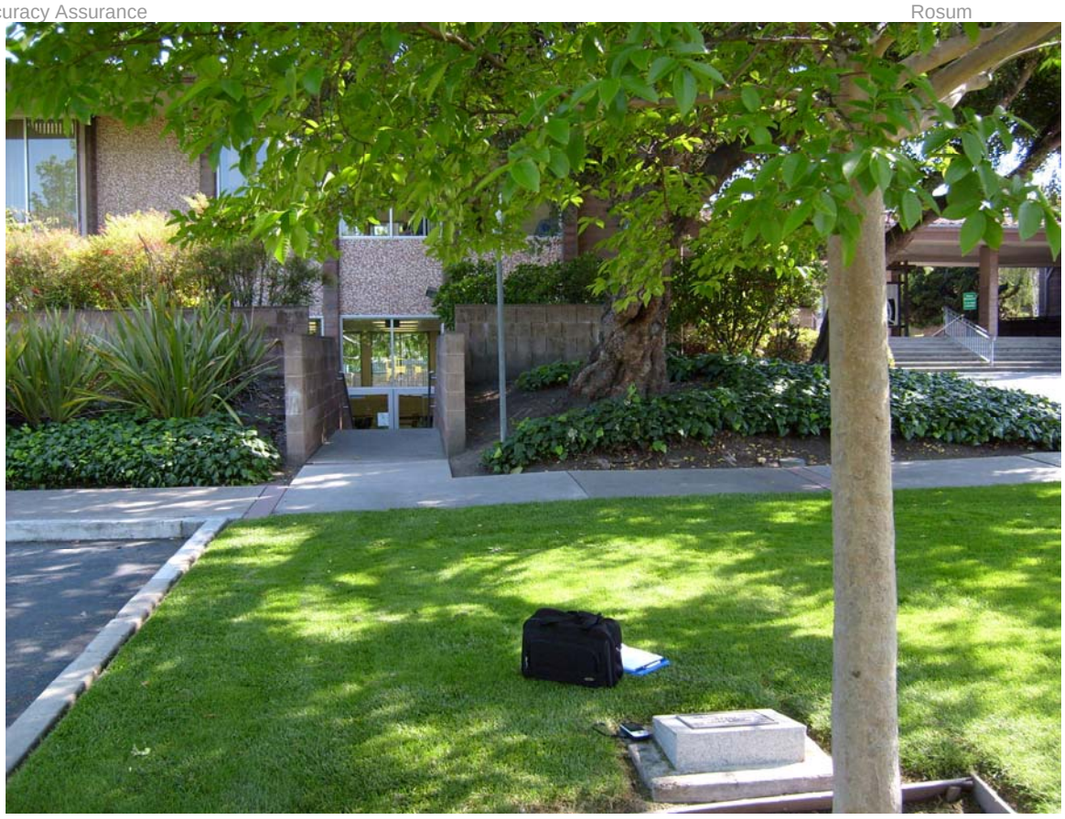
Site 7

Move Ahead.

1500_Warburton Ave_Reference Point.jpg

Site 8

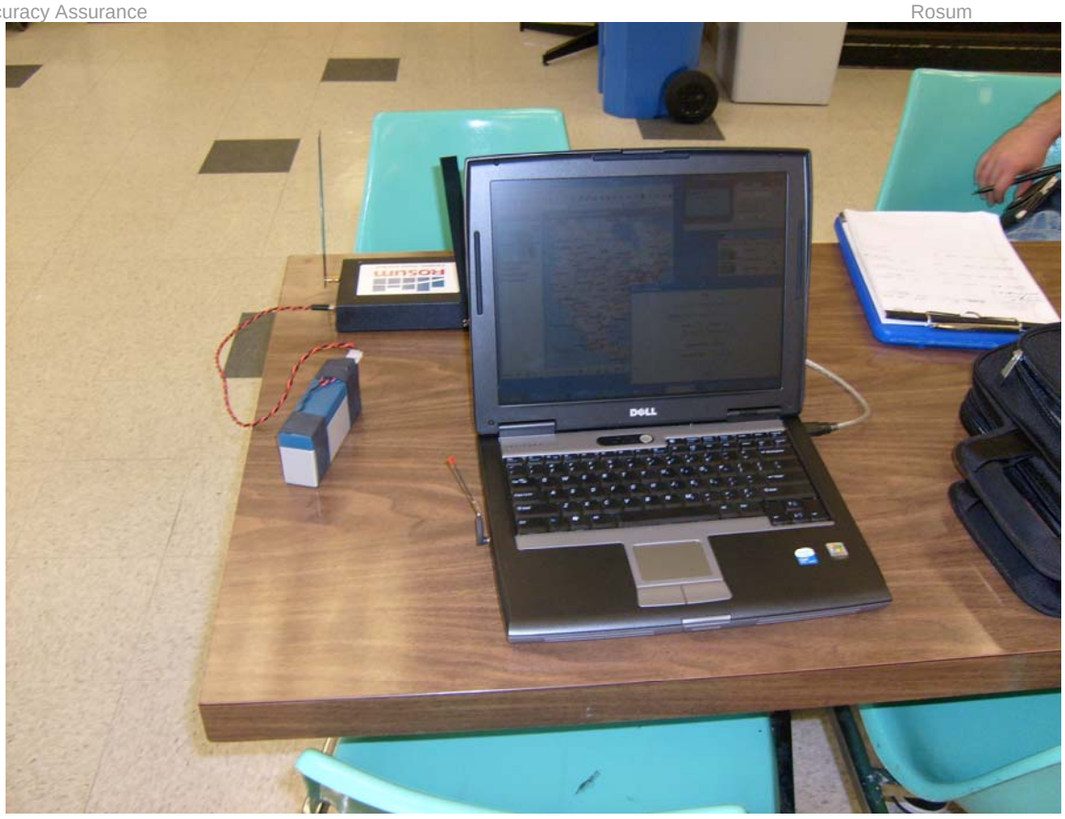
Move Ahead.



1500_Warburton Ave_Facility.jpg

Site 8

Move Ahead.



1500_Warburton_Test Point.jpg

Site 8

Move Ahead.

2600_Homestead Rd_Reference Point.jpg

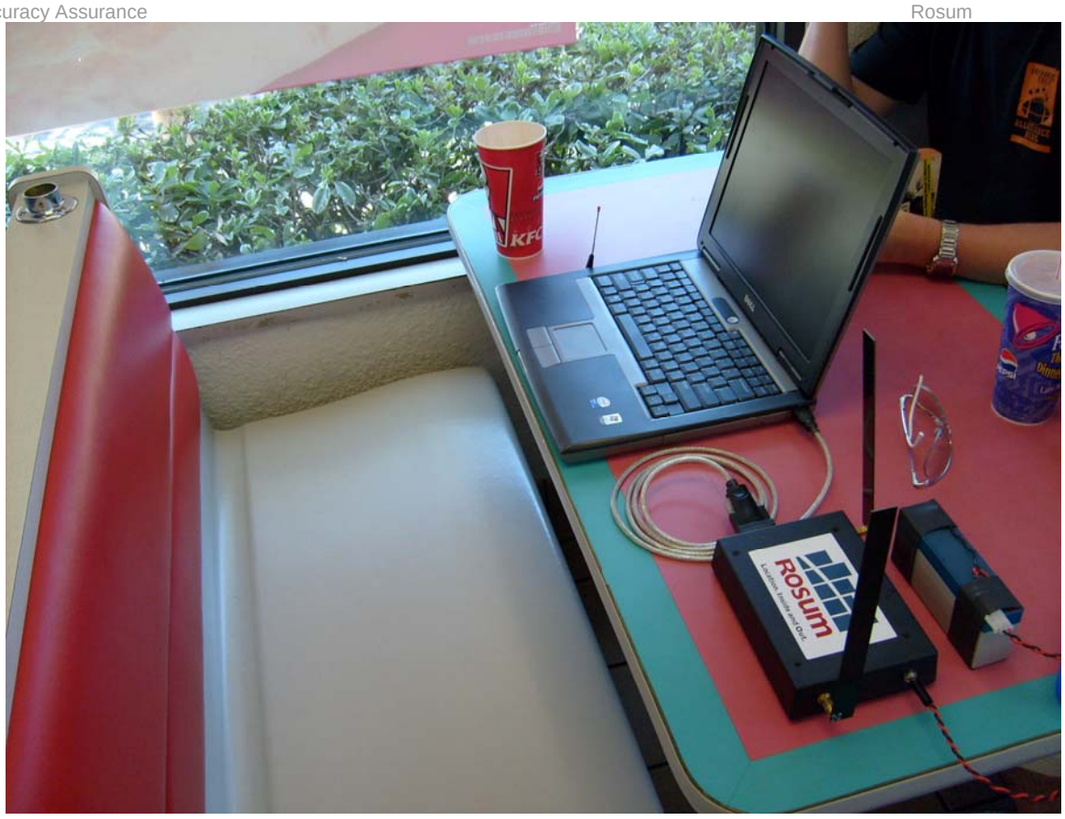
Site 15

Move Ahead.

2600_Homestead Rd_Facility.jpg

Site 15

Move Ahead.



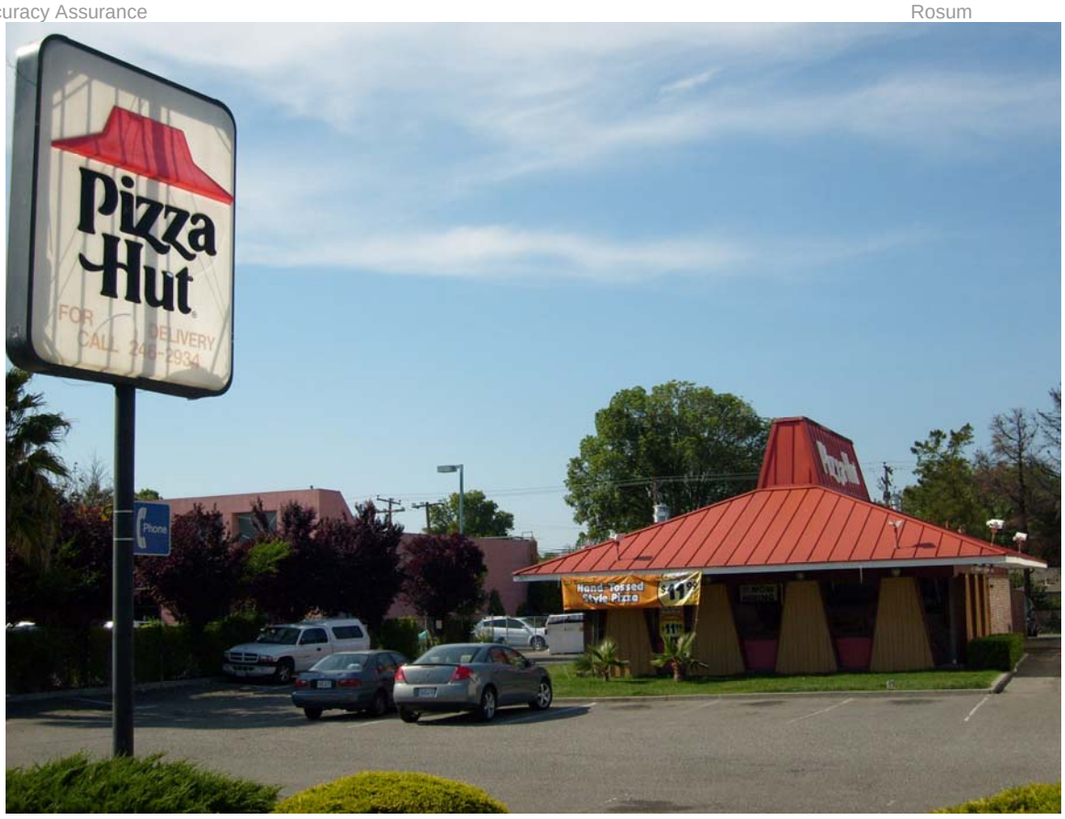
2600_Homestead_Test Point.jpg

Site 15

Move Ahead.

2695_El Camino_Reference Point.jpg Site 9

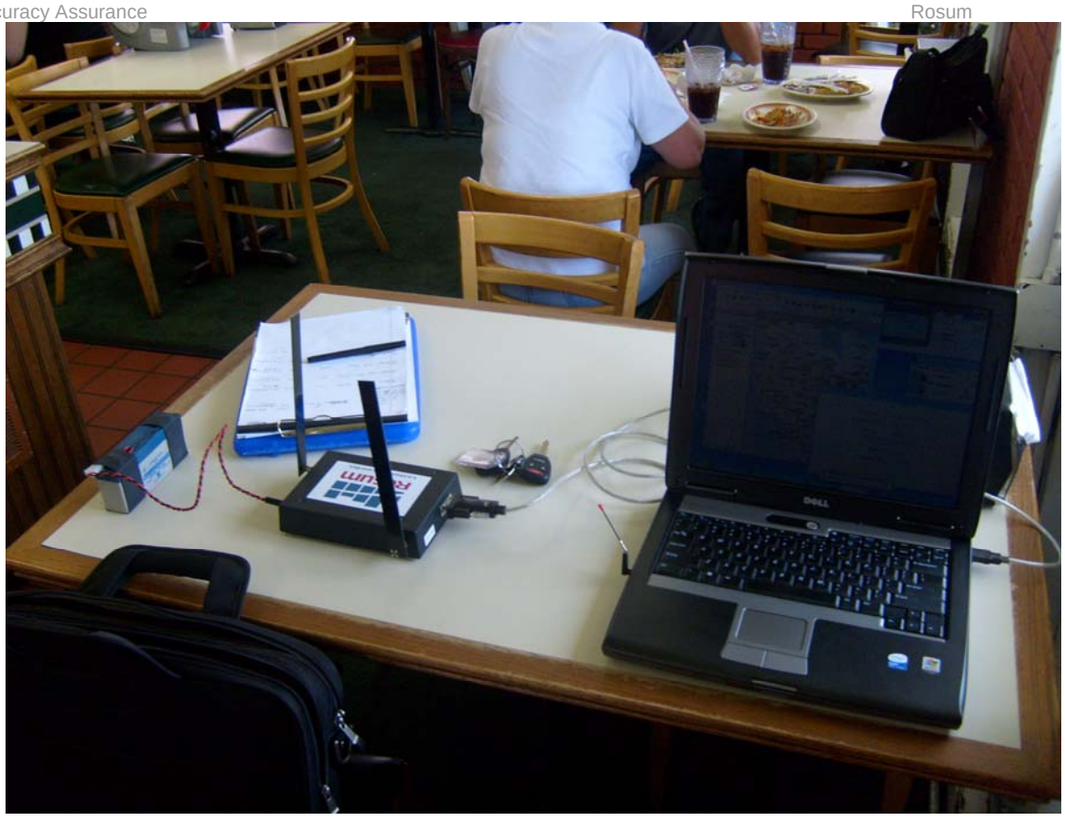
Move Ahead.



2695_El Camino_Facility.jpg

Site 9

Move Ahead.



2695_El Camino_Test Point.jpg

Site 9

Move Ahead.

2900_Bowers Rd_Reference Point.jpg

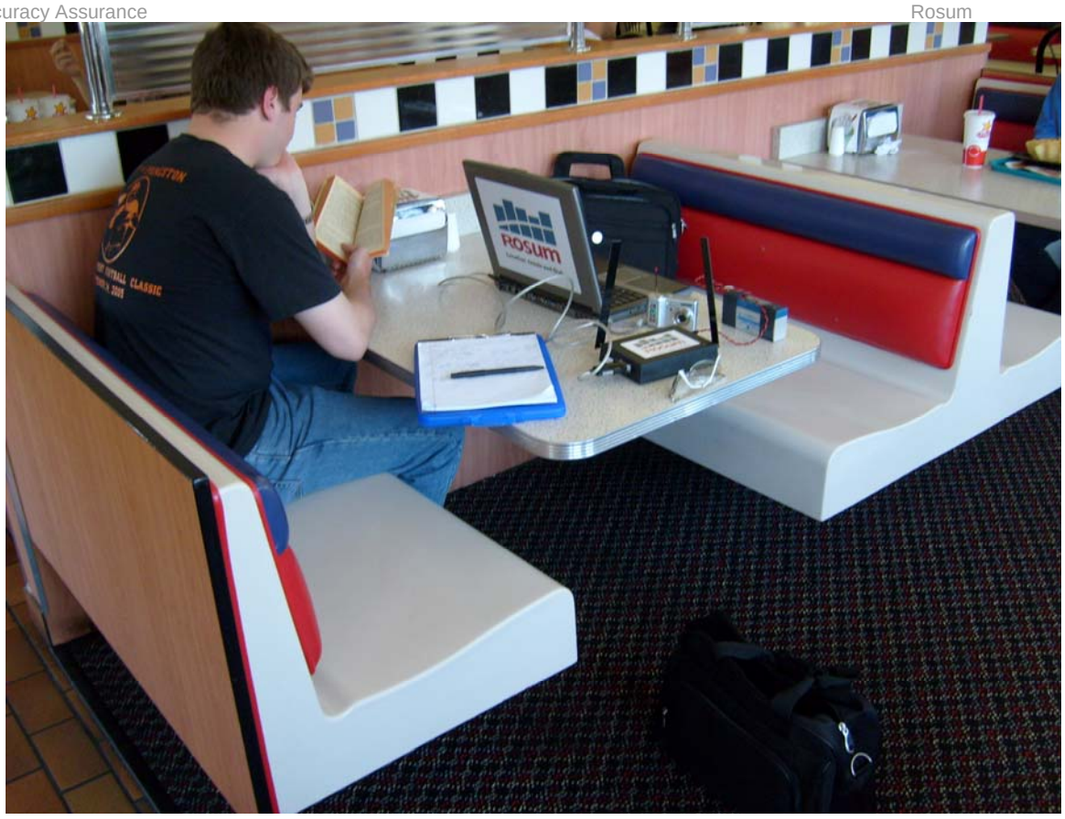
Site 13

Move Ahead.

2900_Bowers Rd_Facility.jpg

Site 13

Move Ahead.



2900_Bowers Rd_Test Point.jpg

Site 13

Move Ahead.

3149_Mission College Dr_Reference Point.jpg

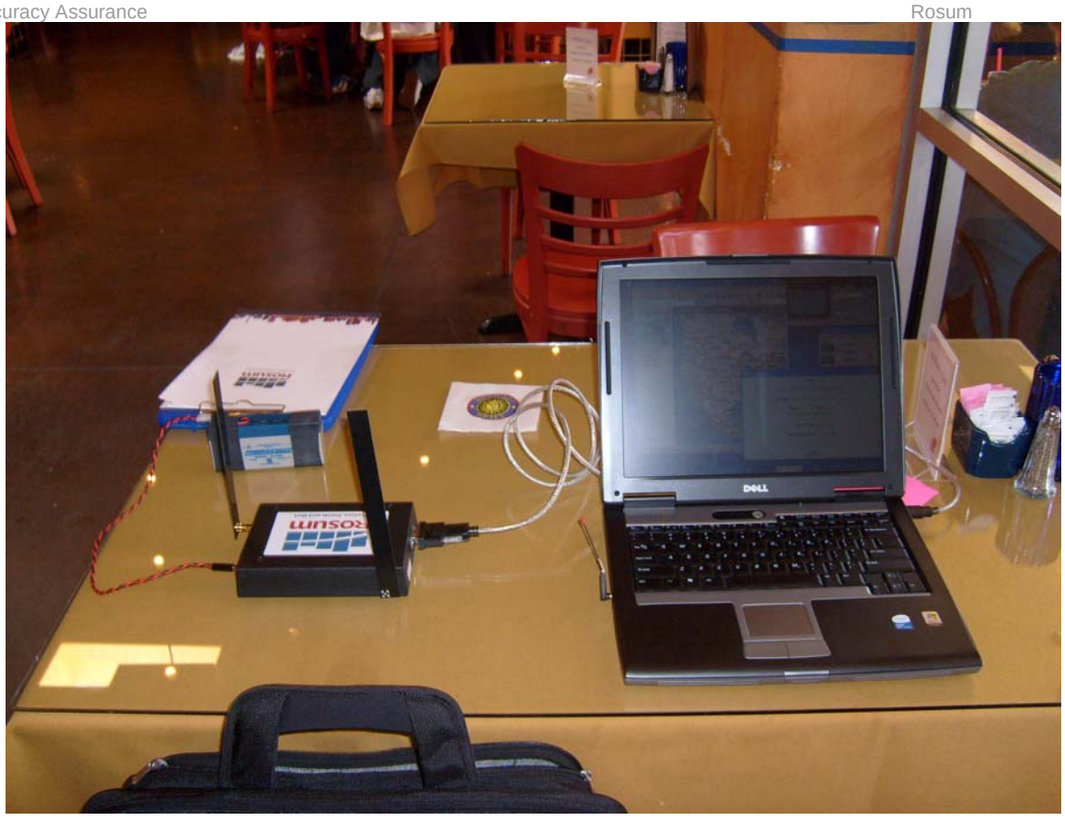
Site 10

Move Ahead.

3149_Mission College Dr_Facility.jpg

Site 10

Move Ahead.



3149_Mission College Dr_Test Point.jpg

Site 10

Move Ahead.

Santana Row_Parking Garage_Reference Point.jpg

Site 2

Move Ahead.

Santana Row_Parking Garage_Facility.jpg

Site 2

Move Ahead.

Santana Row_Parking Garage_Test Point.jpg

Site 2

Move Ahead.

2855_Stevens Creek Blvd_Reference Point.jpg

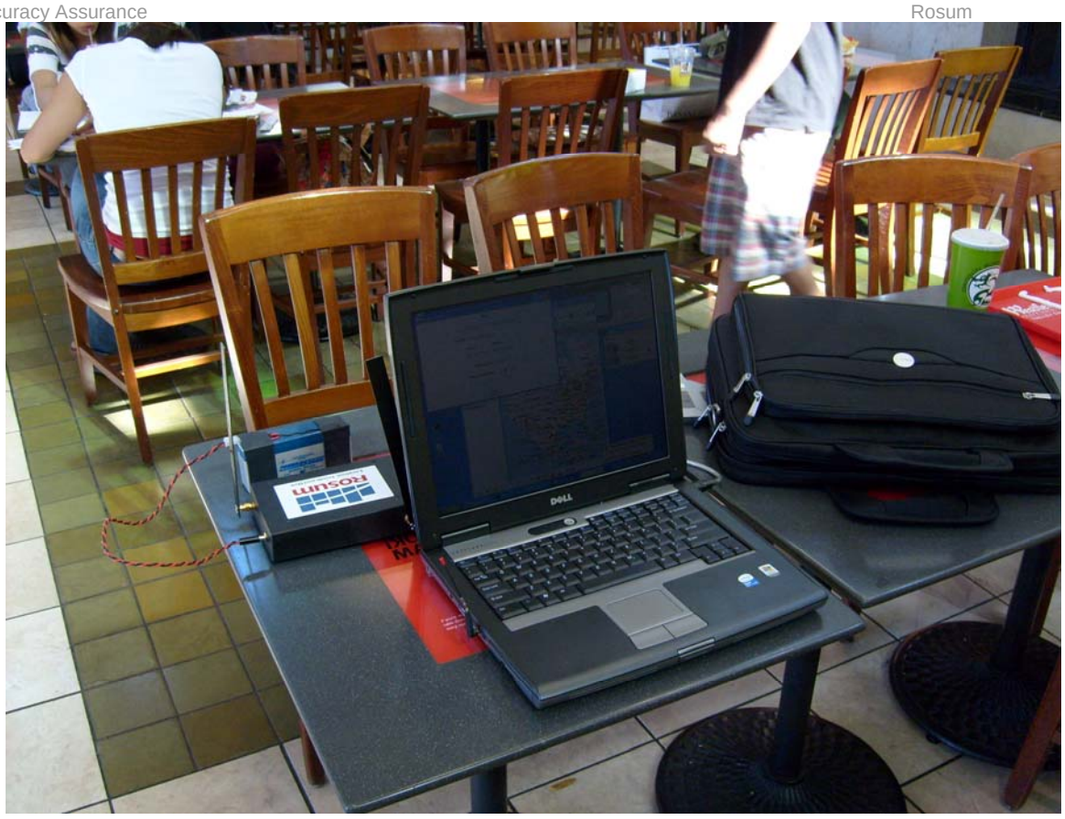
Site 3

Move Ahead.

2855_Stevens Creek Blvdl_Facility.jpg

Site 3

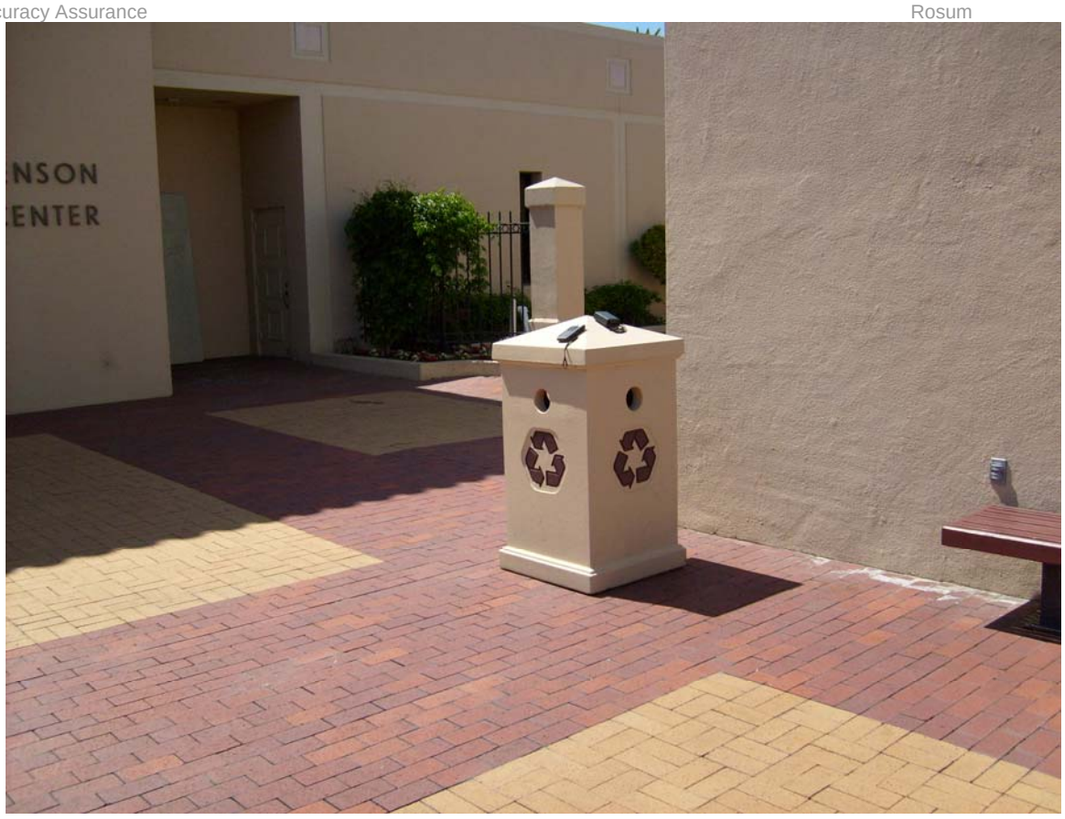
Move Ahead.



2855_Stevens Creek Blvd_Test Point.jpg

Site 3

Move Ahead.



Santa Clara Unv_Benson Memorial Building_Reference Point.zip

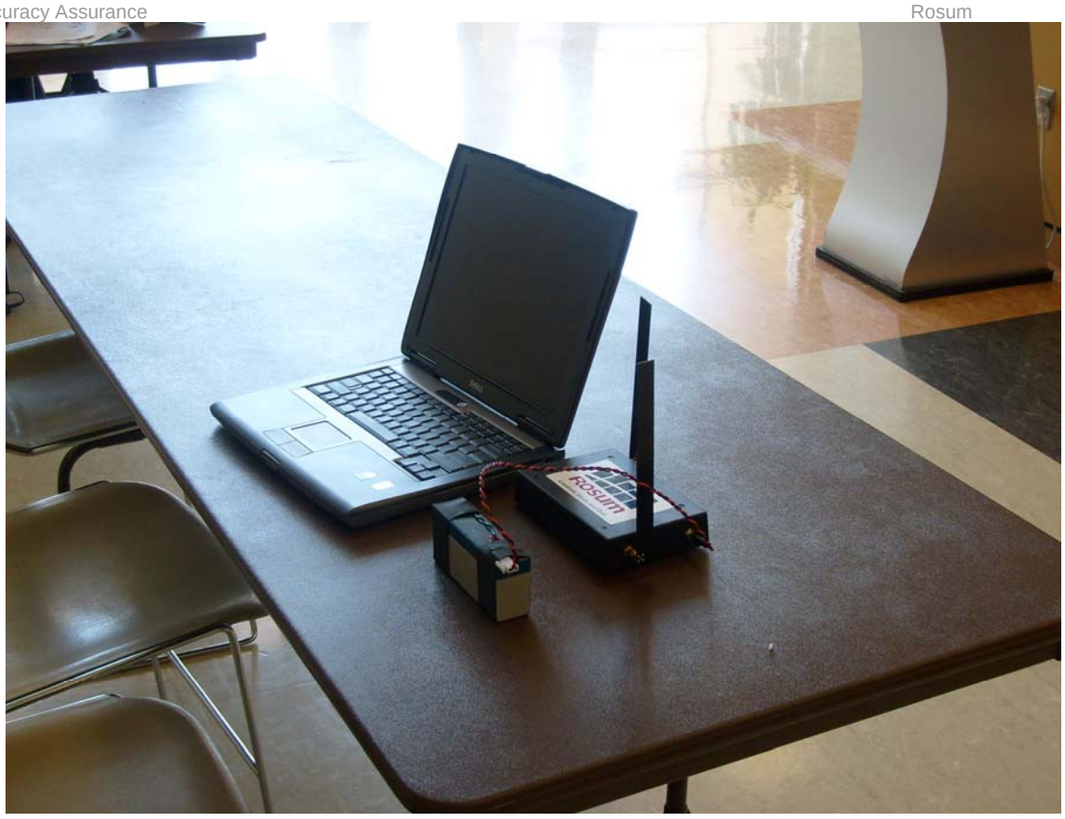
Site 5

Move Ahead.

Santa Clara Unv_Benson Memorial Building_Facility.jpg

Site 5

Move Ahead.



Santa Clara Unv_Benson Memorial Building_Test Point.jpg

Site 5

Move Ahead.

990_Linded St Suite 71_Reference Point.jpg

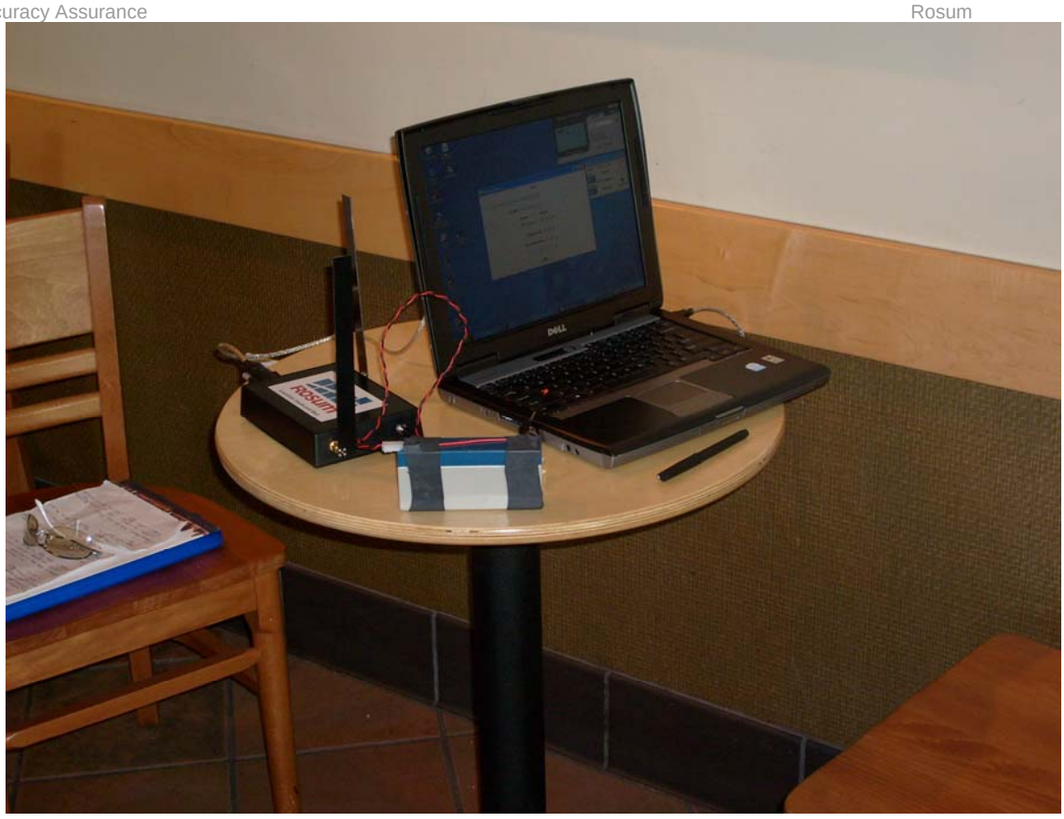
Site 4

Move Ahead.

990_Linden St Suite 71_Facility.jpg

Site 4

Move Ahead.



990_Linden St Suite 71_Test Point.jpg

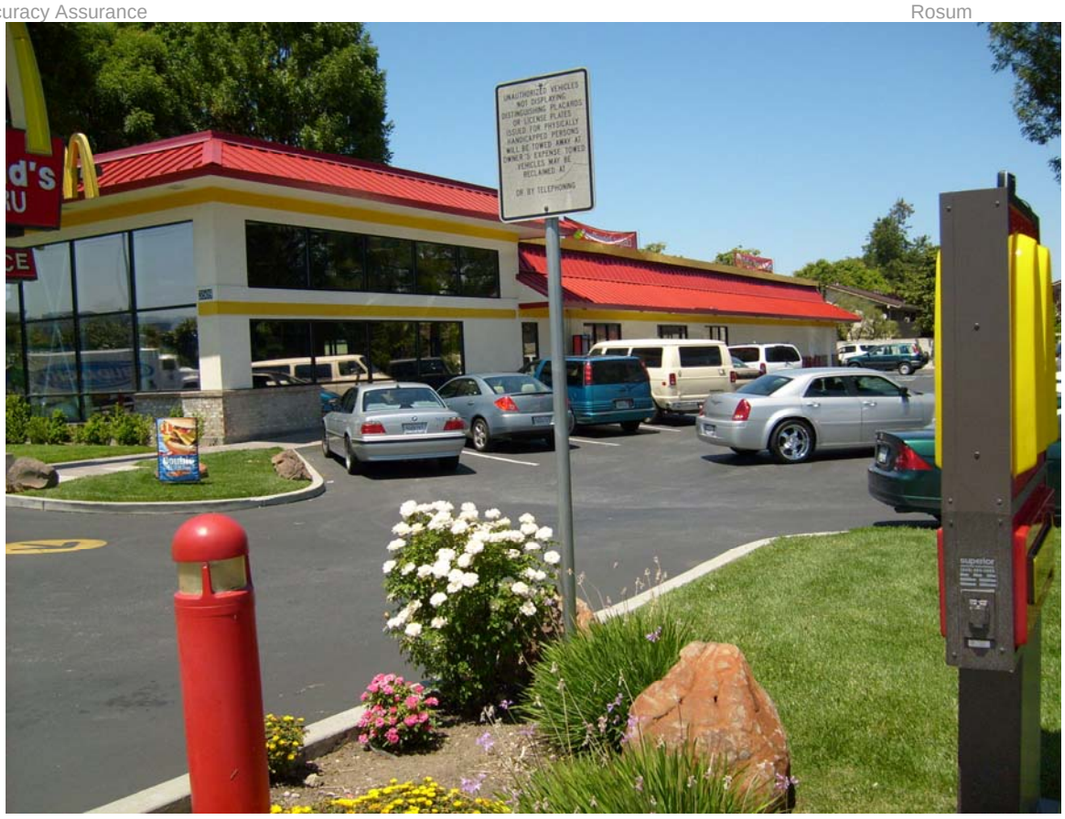
Site 4

Move Ahead.

3509_Homestead Rd_Reference Point.jpg

Site 14

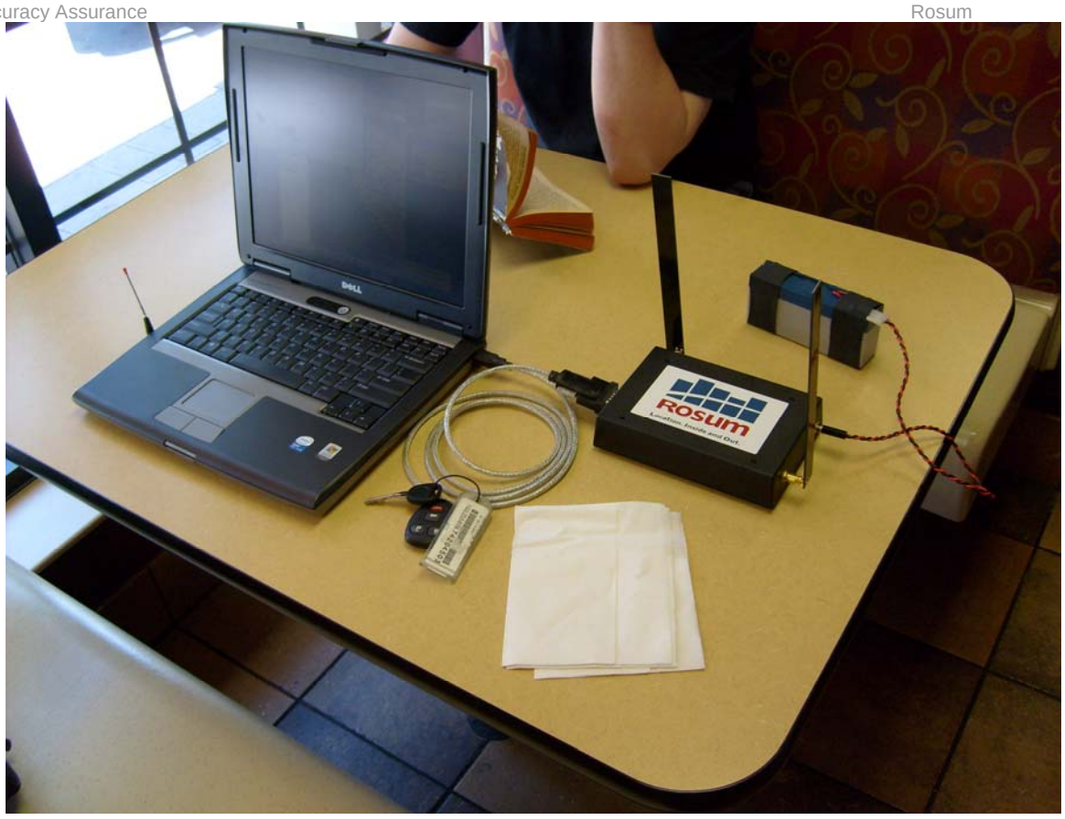
Move Ahead.



3509_Homestead Rd_Facility.jpg

Site 14

Move Ahead.



3509_Homestead Rd_Test Point.jpg

Site 14

Move Ahead.

1098_Lexington Street_Reference Point.jpg

Site 6

Move Ahead.

1098_Lexington Street_Facility.jpg

Site 6

Move Ahead.

1098_Lexington Street_Test Point.jpg

Site 6

Move Ahead.